How Brokers Can Help You p.65
Plastics Add Package Values p.74
Spraying Waste Pays Off p.112

NOVEMBER 1957

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FOOD ENGINEERING

FOR MANAGEMENT
IN MANUFACTURING,
PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION

Management's Challenge Today

Page...49

GMA's Paul Willis turns spotlight on new opportunities

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FOOD ENGINEERING

NOVEMBER 1957

VOL 29 NO. 11

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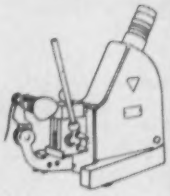

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For the "Whole Man"

As indicated by the new front cover on this issue, something new has been added to FE. Material for men who direct the marketing operations of food manufacturing companies is included.

Now FE serves management—those responsible for operations or functions—in all phases of food manufacturing and processing.

Our purpose is to help readers to meet two challenges posed by recent trends in our industry. One is to achieve close integration of management functions necessary for the more efficient overall operation that will permit reasonable profit at competitive prices.

The other challenge is to make marketing more efficient and productive from the manufacturer's end, and thereby supplement the cost reduction achieved through past and future plant modernization.

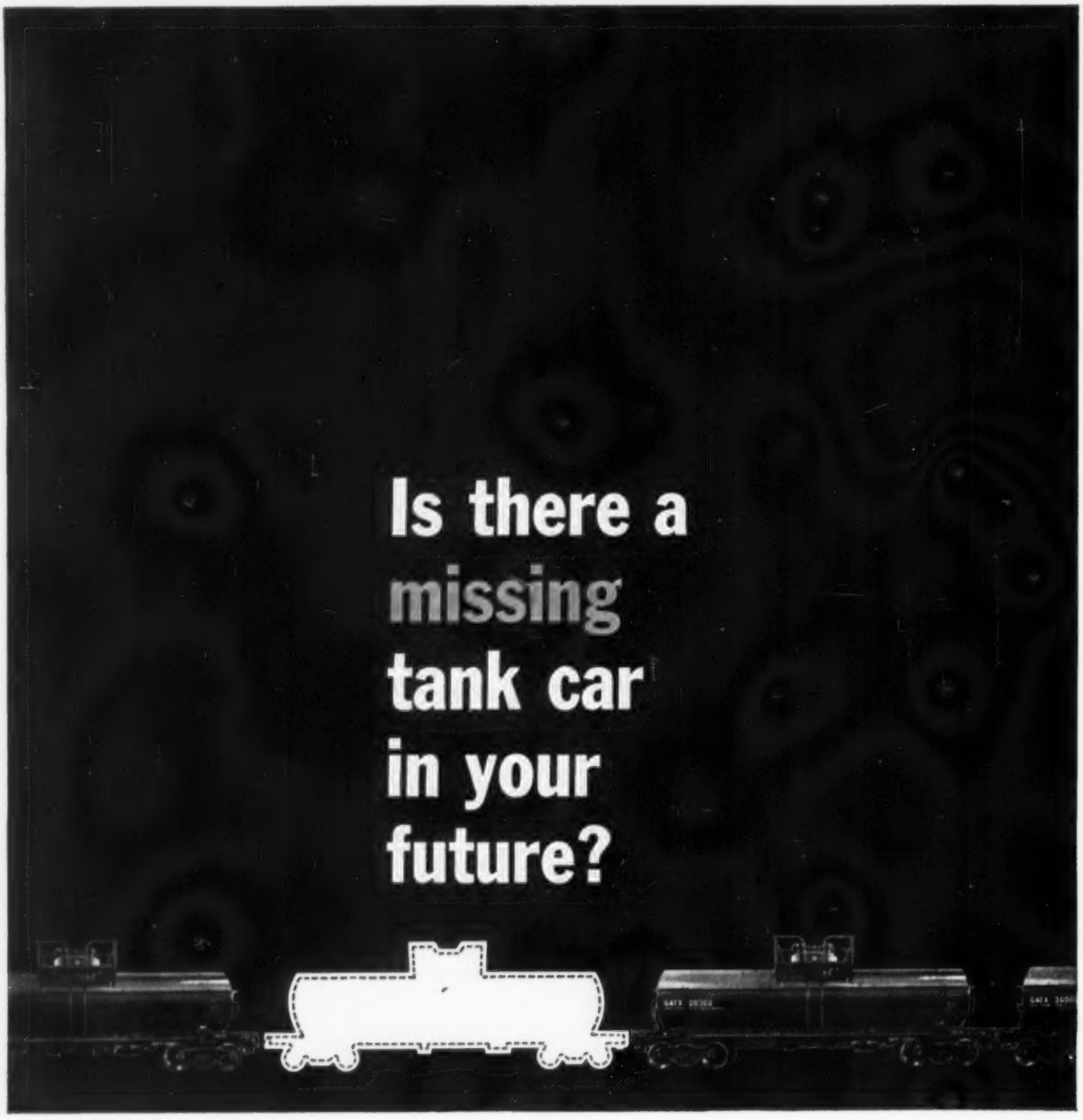
Both of these challenges are pointed up in the significant article by Paul Willis (page 49). And what this means to you as an individual—and to your future—is highlighted in FE opinion (page 45).

New Makeup, Too

As you turn through the pages of this issue, you will find a new arrangement of articles and departments conceived for your convenience. Special material on marketing appears in one group of pages, following lead-book articles. And the same for information on packaging, manufacturing, and engineering.

This makes it easier to locate information on different phases of your business. You will, of course, want to read articles and items in all sections of FE to keep you abreast of progress in all phases of food manufacturing. Otherwise you will not be capitalizing on the opportunity to make yourself the "whole man" needed today in food company management.

Your comments on the new FE for the whole management man in food manufacturing will be appreciated by the Editors, for FE is your publication.



That's almost certain to be the plight of companies who don't plan for their tank car requirements in the decade ahead. It's no secret that available general-purpose tank cars are going to be limited. With normal obsolescence of today's facilities, the continuing steel shortage, and with forecasts pointing to a more than 50% expansion in our economy, *liquid product shipments may be difficult . . . may miss tomorrow's sales opportunities.*

P. S. Plan now to discuss your long-range needs with our GATX District Man. You'll find . . . it pays to plan with General American.

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TRENDS & FORECASTS

Special

FOOD ENGINEERING

Service to Executives

1958 will be a very good business year, but one of the most competitive since World War II, McGraw-Hill economists predict. Gross national product is put $10 billion above this year's $435 billion. Food will be hot.

With $650 billion economy in 1968, food sales should reach $113 billion. The potential in 10 years is 50% greater than current $75 billion—and more with increased selling—says Arno H. Johnson, J. Walter Thompson Co.

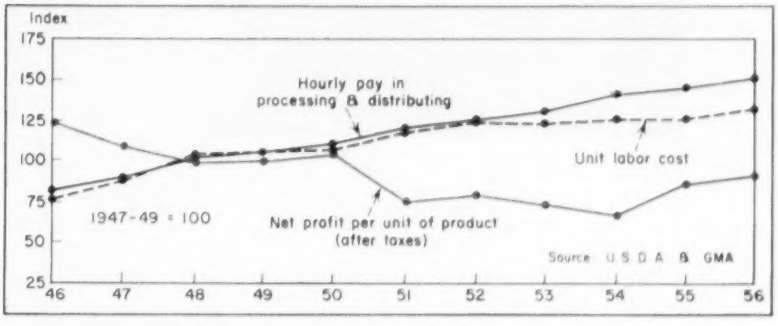
New "mass-class market" accounts for 72% of consumer product expenditures, a study by *Life* reveals. In this group are families (63%) earning $3,000 to $10,000 a year. Points up big potential for convenience foods.

Net profits of 89 leading grocery manufacturers averaged a slim 2.7% for first half of 1957, GMA reports. Figure was 2.9% all of 1956. Higher costs are responsible. Sales volume has been good.

Competition for volume is fierce—among manufacturers and between national and private brands. Regional supermarket chains have increased "controlled brand" volume 5-fold in 5 years, following lead of giant chains.

There may be tremendous future increase in manufacturing by retail chains, challenging national-brand firms. But this vertical integration can reverse, as with Consolidated Foods' entry into retailing.

Many leading food manufacturers are buttressing their business by further product diversification, by acquiring smaller firms, and by stepping up profitable foreign operations. More is being spent for new product research. Modernization continues, along with abandonment of outmoded plants.



WAGES UP, PROFITS DOWN are food industry trends dramatically shown by the three curves. Unit profits likely will be lower this year as labor and other costs continue to increase and competition holds prices relatively low. Continued improvement in efficiency has minimized unit labor cost rise.

Straw in Labor-Cost Wind

It took an 86½¢-an-hour package to please drivers hauling bulk milk into New York. Pay goes up 40¢ in the first year of a 3-year pact, and 15¢ each succeeding year—plus 5¢

TAKE *Another* LOOK

at this

Conveyor Roll Bearing

- ★ Will Not Contaminate
- ★ Unaffected by Dust, Water or Fruit and Vegetable Juices
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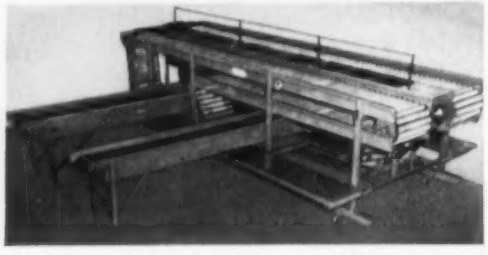
it's an *Arguto*

"Maintenance-Free" OILLESS BEARING

Here's Another Arguto-Equipped Conveyor in the Food Industry



On this Paramount Potato Grader, manufactured by the Paramount Mfg. Co., Stockton, Calif., potato dust and dirt do not affect the smooth operation of the rollers—they roll on Arguto Oilless Bearings—the best bearings for all types of food handling equipment.

For trouble-free, wet or dry conveyor operation, be sure to specify Arguto Oilless Bearings for your conveyor rolls and screw conveyors. Write for Catalog No. 240 and send a print or sample of your present bearing. We'll gladly show you the difference.

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20 years without a drink

Trends & Forecasts

for welfare and 11½¢ for pensions. Former hourly rate ranged from $1.87 to $2.07.

In addition, a 5-day 40-hour week was granted, instead of a 6-day 48-hour week. Time and half is paid after 10 hours in one day. The vacation period was extended to 4 weeks after 15 years, and the number of paid holidays increased from six to eight.

These gains by International Brotherhood of Teamsters point up a continuing labor cost trend.

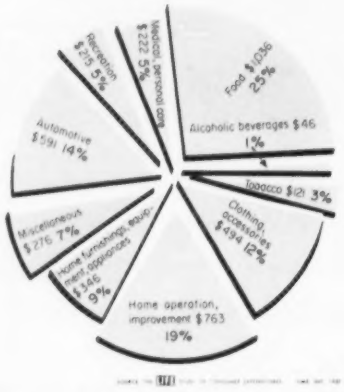
Freezers Air Problems

Contributing to the depressed state of the frozen food market are overproduction and the growth of buyers' labels. That's how an unhappy situation was sized up by Ralph O. Dulany, president of the J. H. Dulany Co., Fruitland, Md., at a recent meeting of Eastern Frosted Foods Association.

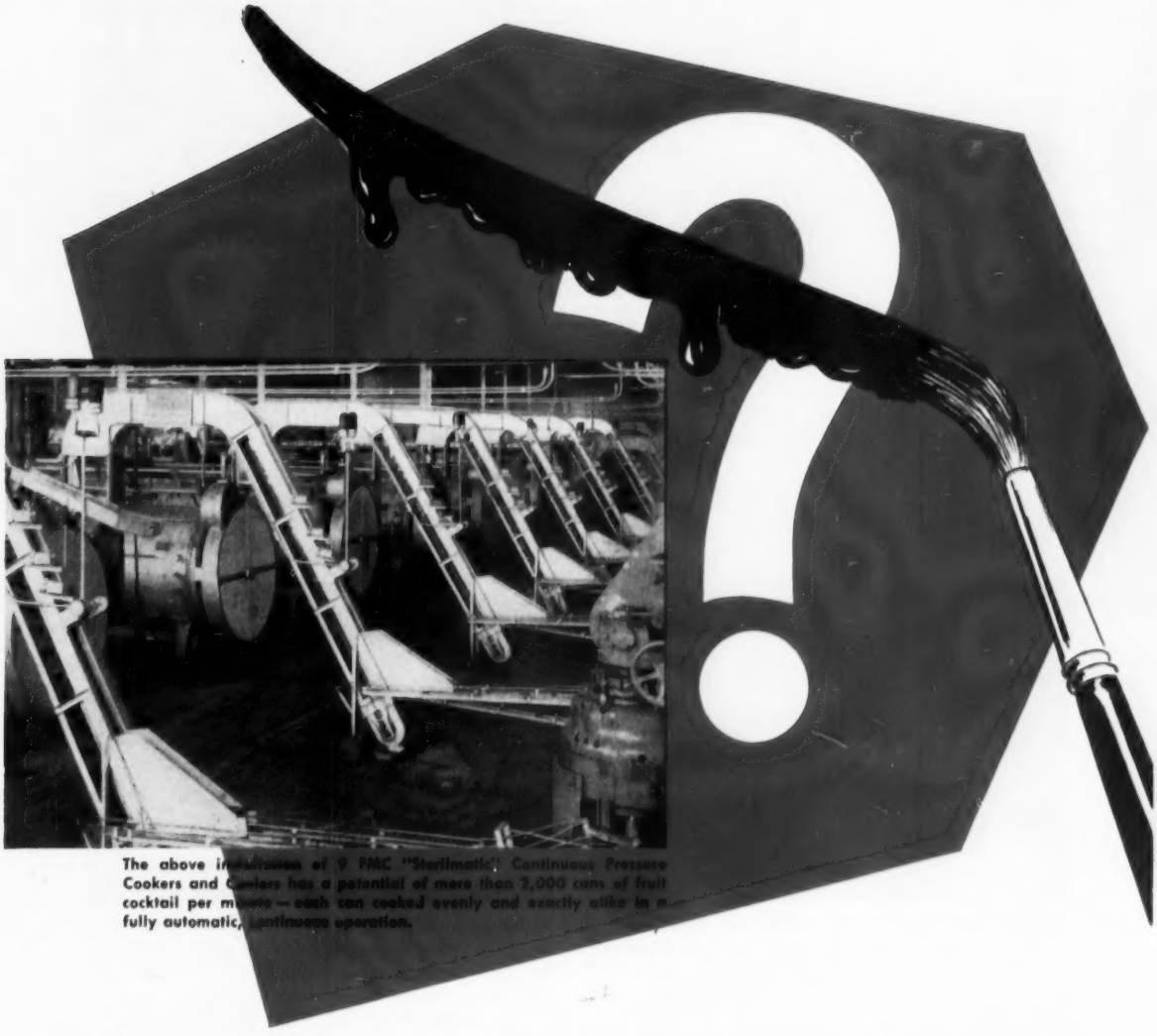
Present low profits of many packers are traceable largely to those factors.

To correct these conditions, remedies are within the industry's power, Mr. Dulany stated.

The packer should: (1) Reduce production to a volume he can sell profitably. (2) Increase efficiency and cut every possible cost that will not impair quality. (3) Stop trying to grab marginal business, and pull out of losing markets. (4) Insist that



FOOD'S PIECE OF PIE is by far the biggest cut of the dollars spent by the average U. S. family for consumer goods and services in 1956. Based on a survey by *Life*, this chart also indicates products and services which food must outsell to reach its full potential. Average total household expenditure is $4,110.



The above installation of 9 FMC "Sterilmatic" Continuous Pressure Cookers and Coolers has a potential of more than 2,000 cans of fruit cocktail per minute — each can cooked evenly and exactly alike in a fully automatic, continuous operation.

Taking the Guesswork out of Commercial Processing

The "Sterilmatic"* in-can method of processing gives canners everything they need to maintain highest uniformity and quality standards with dependable regularity.

It literally takes the guesswork out of sterilizing and quality control. Now canners control time periods and temperatures to predetermined measurements of unbelievable accuracy. Instruments and controlling devices allow any selective degree of temperature to be maintained with utmost dependability. The continuous flow of canned foods is fast, smooth and gentle. Efficiency is unmatched. Product texture, taste, color and nutrients are preserved as with no other cooking method.

See how the FMC "Sterilmatic" Continuous Pressure Cooker and Cooler can fit into your present operations. Just call your nearest FMC representative, or write for full information. There's no obligation.

*Trade Mark — Reg. U.S. Pat. Off.

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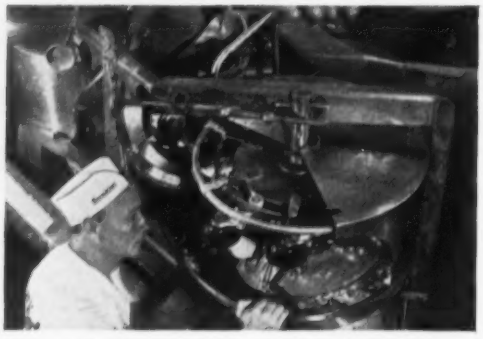
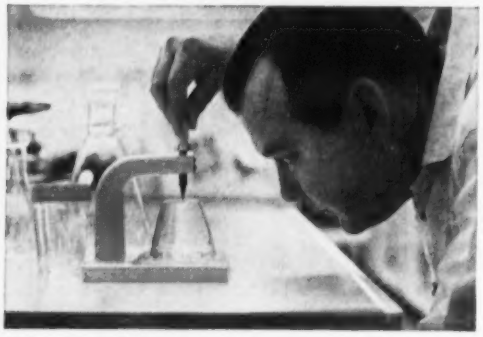
For more data, circle this page number on card at back →

One look at the huge, sprawling buildings at one of the Exchange Products plants and you know that big things are happening inside. For here *citrus* is king. Trucks pour in with fresh fruit from groves all over California and Arizona. Conveyer belts hum along in every direction. And Exchange products are shipped to nearly every part of the world.

Why 'Exchange' products serve you better



Utmost cleanliness is the watchword at Exchange Products plants. Everything has that "just washed-down" look. Every four hours, extraction equipment is completely cleaned. Every third day, the entire plant closes down for a thorough washing.



Exchange quality is assured by constant checking in extensive testing laboratories. In fact, rigid quality controls have been set up *throughout* the plant to make sure that every product measures up to Exchange quality. Sunkist produces more than 400 different citrus products.

The world's largest citrus research department is maintained by the Sunkist Growers to develop new growing methods, to improve manufacturing processes, and to perfect better products. Today, with a backlog of more than 60 years experience, Sunkist has accounted for 118 separate U.S. patents.

Just three of many Exchange products are *Exchange Preserver's Pectin*—guarantees a more uniform finished product; *Exchange Low Methoxyl Pectin*—jells *without* sugar, tasteless, controls "weeping" in pies; *Exchange Lemon Juice*—brings out natural flavor of *any* food. Superior acidulant, excellent anti-oxidant.

Sunkist Growers

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Distributors for

Exchange Lemon Products Co., Corona, Calif. • Exchange Orange Products Co., Ontario, Calif.

his advertising agency get into the battle, knowing his markets and their problems at first hand, and give him tailored service that will make every advertising dollar hit the mark.

The fishing industry can increase per capita consumption through the formation of larger companies that can launch effective nationwide advertising. That was the observation of R. P. Fletcher, Jr., president, Booth Fisheries Corp.

Frozen Peas Down, Cherries Up

This year's pack of frozen green peas, 293 million lb., is below last year's record pack by about 18%, according to preliminary data from National Assn. of Frozen Food Packers.

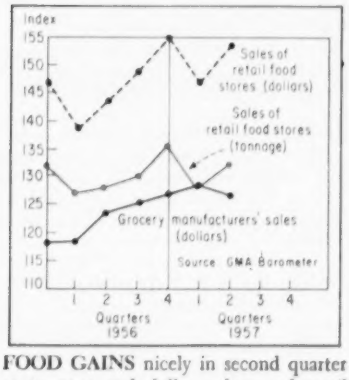
The '57 frozen RSP cherry pack, in contrast, reached a new high of 130.9 million lb.—about 15 million lb. greater than the previous record pack of 1953 and 47% above last year's 89 million lb.

BRIEFS

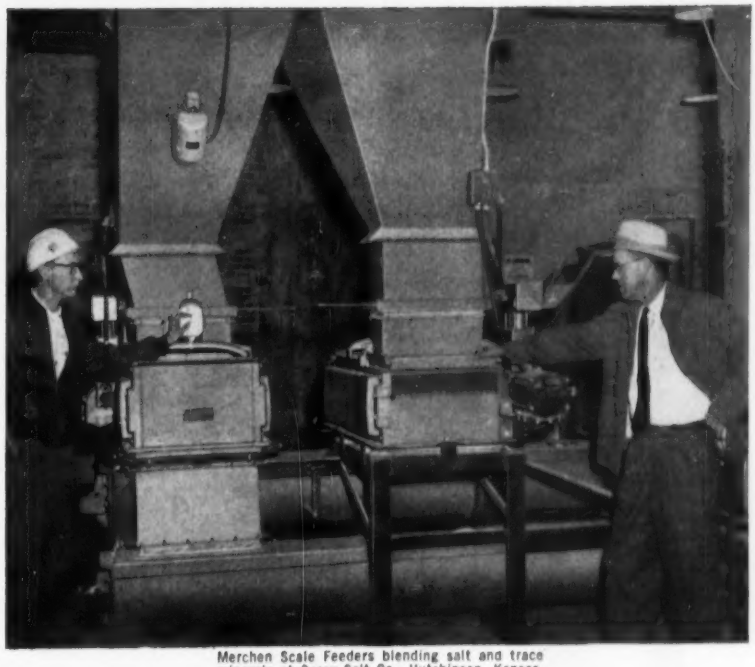
Significant trend to large institutional packages is reflected in 1957 pack of frozen green peas. About 57% of 293 million lb. pack was in packages of 2½ lb. or more, and 40% of institutional went into 50 to 60 lb. containers.

Having recently climbed to highest level in two years, cocoa prices likely will be fairly stable for a few months.

Per capita consumption of processed vegetables rose about 70%, from 56 to 97 lb., between 1937 and 1956.



FOOD GAINS nicely in second quarter as tonnage and dollar volume of retail sales rise. But manufacturers' dollar sales turn down (inventories dropped).



Merchen Scale Feeders blending salt and trace minerals at Carey Salt Co., Hutchinson, Kansas.

MERCHEN SCALE FEEDERS
offer continuous dry blending by weight

The Carey Salt Company produces salt blocks for cattle that contain a percent blend by weight of nutritional minerals. W&T Merchen Scale Feeders were selected for the blending operation.

If accurate blending of dry, free flowing materials is important to your production, Merchen Scale Feeders offer feed rates from 3 ounces to 3000 pounds per minute, always maintaining accuracy within 1% of the feed rate. The feeders compensate for changes in material density to maintain a constant feed by weight.

Where a number of ingredients must be blended, Merchen Feeders can be electrically or pneumatically controlled from other plant equipment for automatic operation. Send for our free booklet M-33, "The Best Weigh is the Merchen Way."

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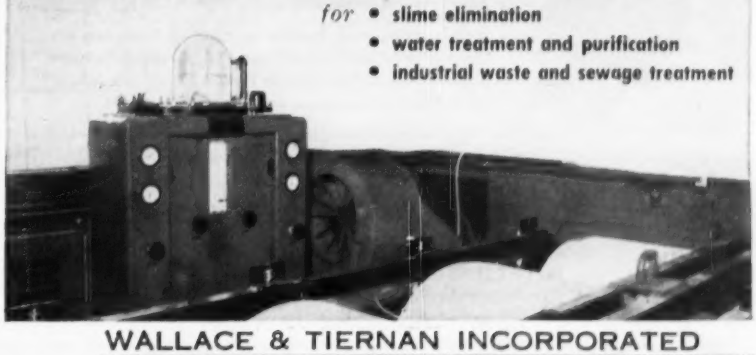

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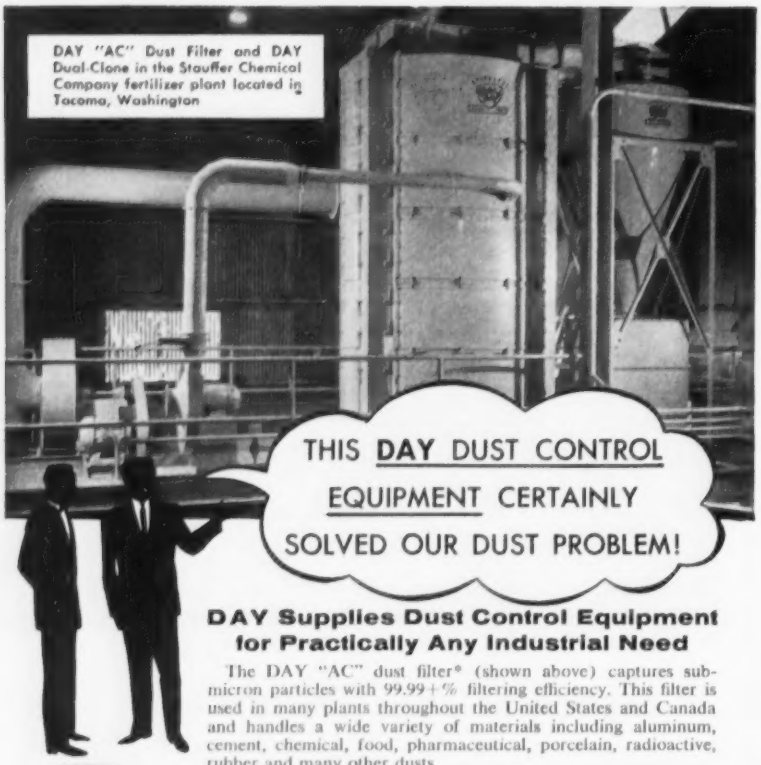


DAY "AC" Dust Filter and DAY Dual-Clone in the Stauffer Chemical Company fertilizer plant located in Tacoma, Washington

THIS DAY DUST CONTROL EQUIPMENT CERTAINLY SOLVED OUR DUST PROBLEM!

DAY Supplies Dust Control Equipment for Practically Any Industrial Need

The DAY "AC" dust filter* (shown above) captures submicron particles with 99.99+% filtering efficiency. This filter is used in many plants throughout the United States and Canada and handles a wide variety of materials including aluminum, cement, chemical, food, pharmaceutical, porcelain, radioactive, rubber and many other dusts.

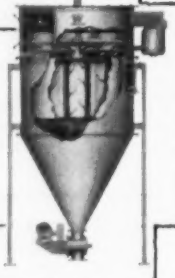
The DAY Dual-Clone (above-right) has low horsepower requirements and operates with unusually low back pressure. It requires no maintenance.

For latest information about DAY "AC" and Dual-Clone equipment write toDAY for Bulletins 559 and 49-DC.

*Licensed by H. J. Hersey, Jr.

DAY TYPE "HV" CYCLONIC SEPARATOR

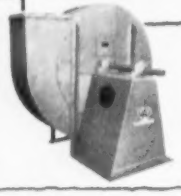
A heavy gauge, welded, high efficiency cyclonic separator. The DAY "HV" has a wide range of applications. It handles abrasive or high temperature dust laden air and requires no maintenance because it has no moving parts. Available for pressure or vacuum operation. For additional information write for Bulletin 576.



DAY TYPE "RJ" DUST FILTER*

A packaged dust filter shipped completely assembled and ready to run. Provides high performance, top efficiency dust control at low cost. High air-to-cloth ratios give extra air handling capacity in small area. Furnished with or without dust fan and discharge equipment. For latest information write toDAY for Bulletin 560.

*Hersey and DAY patents applied for.



DAY TYPE "G" EXHAUST FANS

High air delivery per horsepower required. These fans are designed specifically for dust control applications. Each fan is statically and dynamically balanced before shipment. For further information write toDAY for Bulletin 471.

DAY SINCE 1881

The **DAY** *Company*

DAY SINCE 1881

SOLD in UNITED STATES by
The DAY SALES Company
817 Third Ave. N.E., Minneapolis 13, Minn.

MADE and SOLD in CANADA by
The DAY Company of Canada. Ltd.
P.O. Box 700, Fort William, Ontario

Representatives in Principal Cities

STOP AIR POLLUTION with DAY DUST CONTROL

Trends & Forecasts

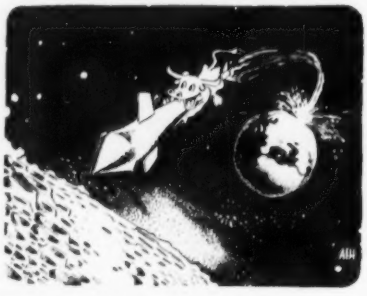
Canned accounted for 27 lb. of the increases; frozen, 14 lb. Fresh vegetables declined from 114 lb. to 106 lb. per capita.

Volume of beet sugar distribution has been running 10% ahead of last year, while cane sugar trails 4%. Larger marketing quotas aid beet refiners. Next year's sugar carryover of sugar likely will be large.

Hourly earnings of food plant workers were 11% higher in July than a year earlier, averaging $1.94. Number of employees in plants during summer season was up, but not quite as high as last year.

HORS D'OEUVRES

► It is suggested that turkeys be given tranquilizing pills as Thanksgiving approaches. That would be only fair. The great birds certainly tranquilize us at the Thanksgiving table.



► Russia's official publication, Pravda, has complained bitterly that meat is being wasted for lack of transportation and refrigeration. Shades of Sputnik! Looks like they'll have to send their meat to the moon.

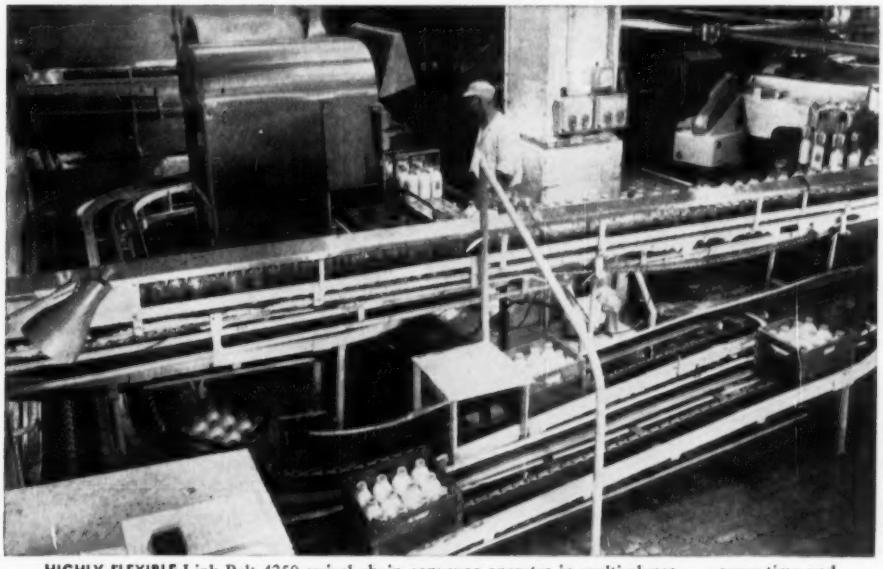
► The twist-off cap for glassed foods has quickly swept the field. Why? Because women can open it. And there goes man's last claim to superiority.

► Donut Institute says that the hole in the doughnut tends to be made larger in depressions, smaller in good times. Come the first of the year, the hole will shrink one-quarter inch. There's the business forecast for 1958.

► You should post copies of your product advertisements on your plant bulletin board. Then your workers might try to make it as good as you sell it.

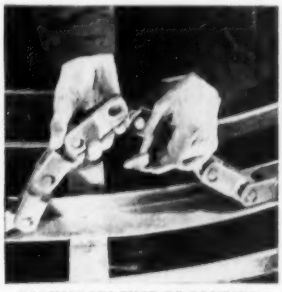
► Per capita wine consumption is higher in the District of Columbia than in any of the states—2.43 gal. Takes a lot of inspiration to be a good Bucaucrat.

Link-Belt 4250 swivel chain conveys around curves—over vertical turns

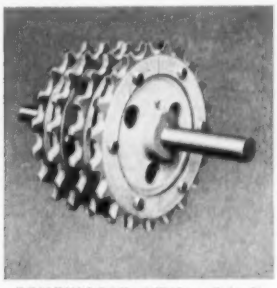


HIGHLY FLEXIBLE Link-Belt 4250 swivel chain conveyor operates in multi-planes . . . saves time and effort while maintaining smooth flow of milk cases.

SMALL SPACE REQUIRED by 4250 chain conveyor gives this packing plant extra storage.



EASILY DETACHED OR COUPLED. Chain may be lifted out of track and taken apart by hand.



RENEWABLE "Flint-Rim" sprocket segments can be quickly attached to sprockets.

Broad top surface of links reduces wear on cases

Durable and extremely flexible, 4250 swivel chain is Link-Belt's answer to multi-plane conveying of cartons, cases, crates and similar containers in breweries, dairies and other bottling plants. Its swivel joint construction permits both horizontal and vertical travel—provides safe handling of containers around 15" radius horizontal turns. And single- or multiple-strand conveyors can be arranged to clear machines and other obstructions . . . or to facilitate receiving, processing, storage or shipping.

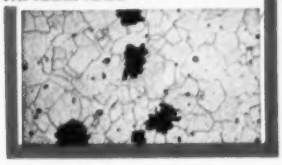
Wear Points Strengthened

Link-Belt 4250 swivel chain consists of links webbed across the top for greater strength and rigidity. Broad, flat carrying surfaces reduce wear on objects being conveyed. And smooth, flat vertical sides provide generous contact areas which minimize wear from track and guides on turns.

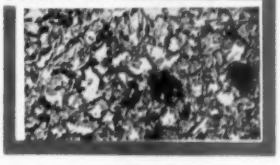
Designed to operate in standard 2-inch tracks, Link-Belt 4250 swivel chain is made with cast ball and socket type pins that simplify detachment or assembly—without tools. Although easily disassembled, it cannot disengage in normal operating position.

File-Hard Promal is standard for this chain, assuring long wear life.

MALLEABLE



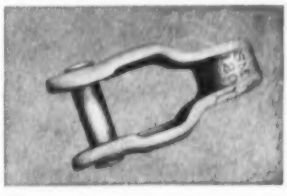
PROMAL



MICROPHOTOS show difference between ordinary malleable iron and Promal. Left—white areas in malleable microphoto represent "free iron" . . . black shows soft nodules of carbon. Right—dark areas in Promal structure show stronger, stiffer reinforcing material which strengthens metal; resists distortion, wear.

SM-120 chain is in wide use on brewery and dairy conveyors

Link-Belt SM-120 chain spells low-cost, straight-line conveying of cases, crates, etc., in various bottling operations. It's made of cast offset links connected consecutively with pins locked against rotation in sidebars. Closed joint construction keeps dirt out. Integral solid round barrels add strength.



SPECIFY "FILE-HARD" PROMAL FOR LONGER WEAR-LIFE

Link-Belt Promal chain with "file-hard" surfaces is the ideal answer for the extra strength and wear resistance demanded by heavy loads and long, sliding conveyors in bottling plant service. This special Link-Belt metal lasts much longer . . . costs but a little more. Both pins and integrally cast links of Link-Belt 4250 and SM-120 chains are furnished in File-Hard Promal.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,302

No. 4 of a series

"I've found continuous pure air:

← For more data, circle this page number on card at back

Kathabar® systems kill over 97% of micro-organisms in large volumes of air!"

Because bacteria are killed by the chemical absorbent in a Kathabar system, it was long suspected that air passed through this system should be relatively free of bacteria. Proof of this theory would be of vital importance wherever airborne organisms contaminate humans or products.

To check this hunch, Surface asked a university research staff to conduct a series of exhaustive tests.

research proof

The conclusion of the research staff is that 97% of all micro-organisms (both pathogenic and non-pathogenic) are removed from air which passes through a standard Kathabar unit.

More tests are being continued in several industries with varying conditions. For example, one project is underway to test the Kathabar system's effectiveness in hospital operating rooms; and another in brewery fermentation cellars.

what does it mean?

Current research results indicate that air purification—long desired by many industries and institutions—can be as feasible and simple as purification of drinking water.

The system's advantages for hospitals show the significance of these findings. It provides the first continuous source of pure air. The liquid sorbent is not affected by the organisms it kills. Neither is it affected by intermittent minor dilution. It is equally effective with any volume of air you require.

The system also provides practical, year-round humidity control. It will humidify in the winter; dehumidify in the summer.

dry, clean coils

Where refrigeration is included in a Kathabar system, coils are kept dry and clean—eliminating a favorable breeding spot for bacteria and molds.

Further advantages of the system seem apparent. For example, it may permit recirculation of air for operating, delivery, cystoscopic, and fracture rooms. Eliminating the need for all-fresh air would reduce both the first cost and operating cost of a Kathabar air conditioning system.

benefits for other industries

Hospitals, of course, are not alone in their need for continuous pure air. Direct and immediate benefits can be realized in other fields, too, such as foods, pharmaceuticals, beverages, clinics, laboratories, and public buildings.

Even where pure air is not a primary factor, it is an important added benefit. Examples are drying operations, storage, testing, comfort applications.

who uses Kathabar systems

Kathabar systems make profits out of air for these industries:

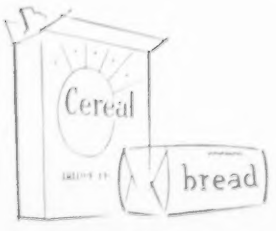
Atomic Energy	Machining
Breweries	Matches
Cake Mix	Marine
Candy	Meat
Cellophane	Offices
Cellulose	Ordnance
Cereals	Paper
Chemicals	Pharmaceuticals
Coffee	Plastics
Comfort	Printing
Compressors	Rockets
Cookies	Rubber
Electronics	Shellac
Explosives	Sugar
Film	Sanitaryware
Foundries	Testing
Gelatin	Textiles
Glass	Transformers
Glue	Transistors
Gum	Vacuum Tubes
Hospitals	Varnish
Hotels	Waterworks
Lacquer	Wire
Lenses	Yeast

how they use Kathabar systems

Many of these industries are now discovering the benefits of air sterilization by Kathabar systems. Others use them to (1) maintain spaces at 80 F and 55% RH or lower; (2) obtain continuous air at sub-freezing dry bulbs and dew points; (3) eliminate condensation; and (4) improve drying processes.

send description of your problem

Air Conditioning and Drying Division
SURFACE COMBUSTION CORPORATION
2382 Dorr Street Toledo 1, Ohio



Kathabar systems by **Surface**

For more data, circle this page number on card at back →

INSTANT CLEARJEL* is a dramatic new cold swelling starch that offers all the wonderful features of regular Clearjel for fruit pie fillings. Full color. Full clarity. Full flavor. *PLUS* the great new feature—Instant Thickening!

INSTANT CLEARJEL reduces preparation time to a matter of minutes. No cooking. No prolonged stirring. No cooling. You simply add water or juice to dry ingredients. Agitate. Then mix in fruit. Now your filling is ready to freeze or bake. All a worthwhile savings in time, labor, fuel.

FREE SAMPLE. See for yourself how Instant Clearjel creates an easier to make fruit pie filling. Write today for a sample and suggested formulas.

*Formerly called Stabilizer 37.

NOW AVAILABLE FROM YOUR BAKERY SUPPLY HOUSE

National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

DEVELOPMENTS TO WATCH

Special

FOOD
ENGINEERING

Service to Executives

Aluminum cans move significantly into food field. Kraft has adopted them as shaker containers for grated cheese. Kaiser makes cans for Kraft. Aluminum cans in several styles have been introduced by Continental.

Lowest cost formula that meets nutritional specifications has been determined by electronic computation at Nutrena Mills. Requirements are "squared off" against list of possible ingredients at varying prices.

New ultrasonic process for tenderizing meats and vegetables is announced by Reflectone Corp. Food is first frozen to retain shape and juices, then exposed to vibrations from transducer in water-filled tank.

Amount of cholesterol in blood is increased by stress of business competition. Heart trouble may well be caused by this, not by fat in diet, according to evidence presented at American Heart Assn. meeting.

Packaging in foil pans is speeded by three new units. One crimps stiff aluminum tops in place, another applies thin foil covers, and a third feeds pans to filling line automatically.

Continuous, automatic starch molder-depositor for candy making has been developed in Australia. Tail-free depositing with pendulum hopper, and aeration of starch to save 20%, are features. Capacity, to 90 rows per min.

Proved by 6 years use in Europe, an impact-in-air mill with spiral classifier now is available here. It has been used to mill flour and to grind spices and other foods. More efficient sizing is claimed.

Continuous processing of solid foods under pressures up to 120 psi. has been made possible by FMC's new pressure feeder. It already has been used for cooking wheat and a variety of fruits and vegetables.

New baby and junior foods are coming at a fast clip. Latest: eggs and bacon, and spaghetti with tomato and meat sauce (Heinz); mint-flavored lamb, raisin-flavored ham, and pork with apple sauce (Swift); high-meat dinners (Gerber).

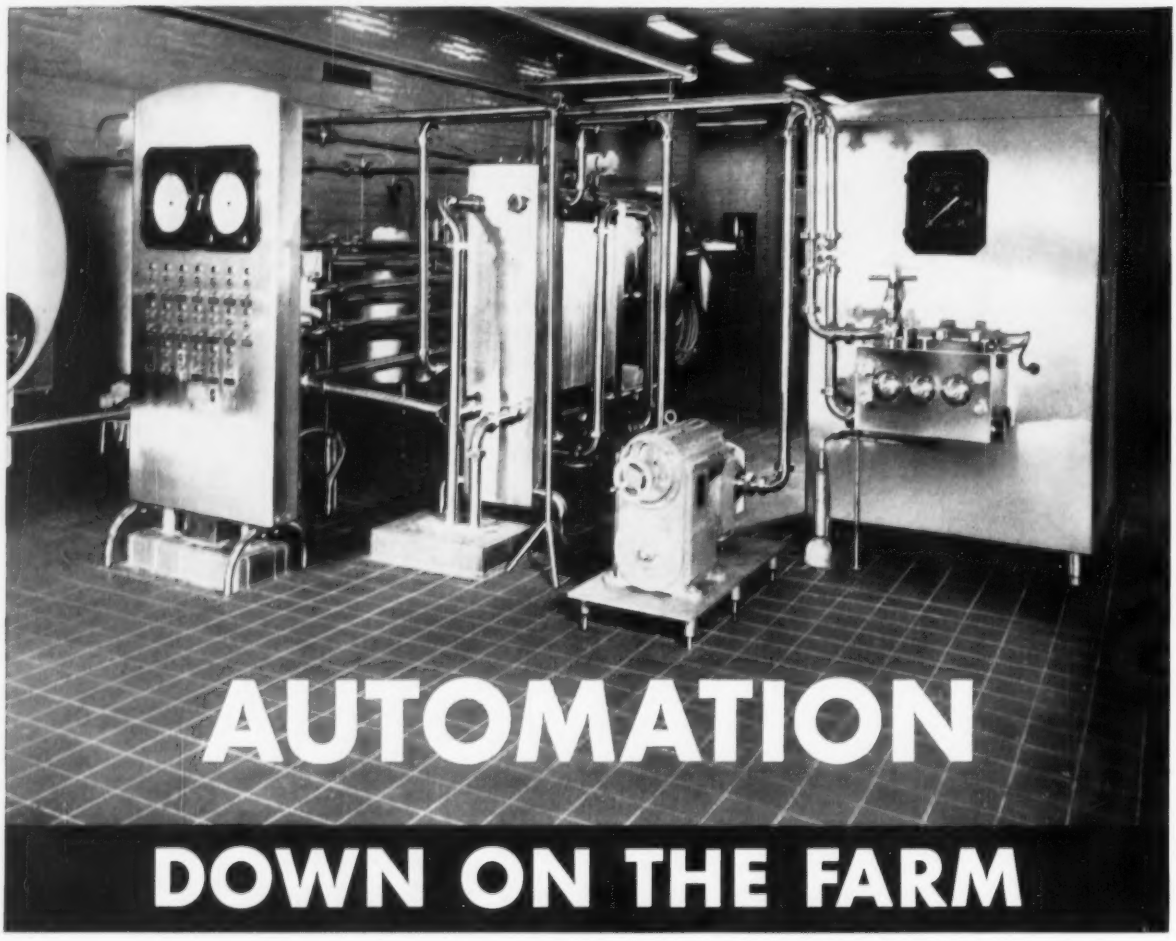
Profitable future for bromelain, a proteolytic enzyme derived from the "mother stump" of the pineapple plant, is seen by Hawaiian Pineapple. Production and marketing are under study.

To reduce marketing costs, new distribution centers with electronic data processing equipment are being established in key locations by Pillsbury. Better service to customers and closer inventory control will be achieved.

Efficient continuous production of vinegar is achieved with a cavitator. It diffuses fine oxygen bubbles through the liquid and eliminates the use of shavings, as in the Frings process. Better control is reported, too.

Vodka is being made from cannery pear waste and cull pears from orchards in Oregon by Hood River Distillers, Inc.

TAYLOR INSTRUMENTS BRING...



AUTOMATION DOWN ON THE FARM

Muller-Pinehurst Dairy Specified "Taylor equipped as usual" for their new CP HTST

THIS brand-new, ultra-modern dairy is located on a farm near Rockford, Illinois, to provide a clean and wholesome "down on the farm" atmosphere for all its products. At the same time, the interior of the plant is carefully designed to make the best possible use of modern procedures and equipment—including a model HTST system with Taylor controls. The Creamery Package 21,500 lb. per hour Crescent HTST unit is controlled from the panel at left of picture.

The Taylor HTST Control System is comprised of a Safety Thermal Limit Recorder (left side of case), a hot water temperature recorder (right), and a Taylor Flow Diversion Valve (behind panel). The CP Stainless Homogenizer at right has a Taylor Homogenizer Pressure Gage.

There are several reasons why this Taylor system is so popular:

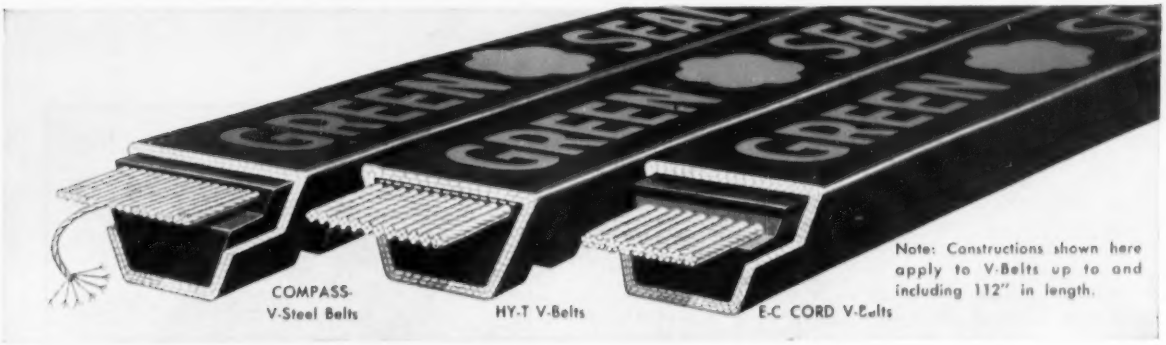
- **Completely automatic control.** Pointer is set to the desired temperature. That's it. No re-adjusting of set point after diversion.
- **Gives greater protection.** Sub-legal temperature milk is immediately diverted.
- **Faster recovery time.** Only one control valve, individually sized and selected for your operation.
- **Simple to operate.** All control adjustments ideally set at factory. All instruments housed in one case.

• • •

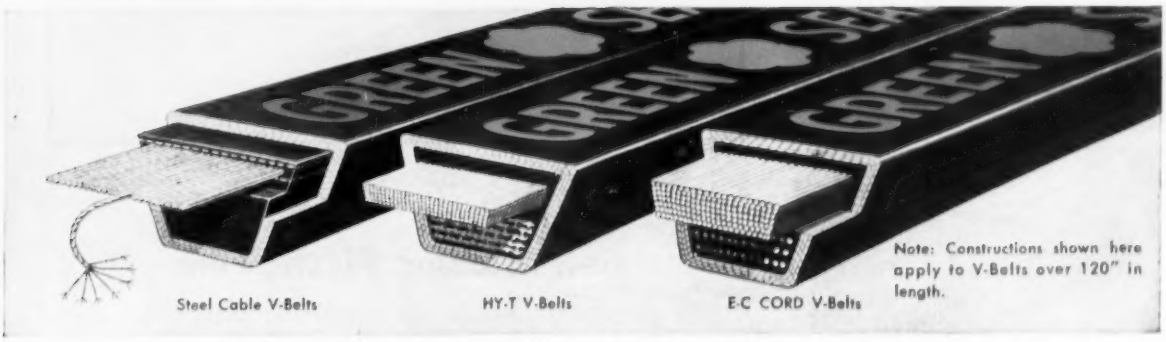
The Taylor HTST Control System gives maximum protection in the pasteurizing of milk and ice cream mix. Ask your Dairy Equipment Supplier about its many advantages, or write for **Catalog 500A.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

Taylor Instruments MEAN ACCURACY FIRST

What's different about



V-Belts with the Green Seal?



Plenty—when you're belting multiple drives. For that Green Seal certifies the dimensional stability of every belt that carries it. There's no surer guarantee that every belt in a set will match every other one—perfectly. And that they'll *stay* matched no matter how long you stock them before installation.

So the dimensional stability of Green Seal belts is solid protection against "loafing," slipping, stretching, scorching and other mismatching troubles. And most of the credit belongs to the belts' load carriers of airplane-type steel cables or Triple-Tempered (3-T) cord — Goodyear "exclusive" cord that's carefully tempered with Tension, Temperature and Time.

This unique 3-T process brings the synthetic cord to its point of greatest strength and stability. Result: the end of shrinkage in storage—plus greatest shock- and stretch-resistance in use. All of which assures you maximum, trouble-free horsepower hours at minimum cost. Why settle for less?

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tire & Rubber Company, Dept. 794, Akron 16, Ohio

Please send me complete information on what makes V-Belts with the Green Seal different from any others made today.

Name_____

Company_____

Street Address_____

City_____ Zone_____ State_____

Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

More Meat for Baby

Fruit-flavored Swift's meats for babies is newest processor's item to go into national distribution. Made in both strained and chopped styles, the new food is available in three varieties:

- Pork flavored with apple sauce,
- Ham flavored with raisin sauce,
- Lamb-flavored with mint.

Packed in a 3½ oz. jar or can (West of the Rockies), the food was introduced as the result of surveys done in 1956.

Spaghetti in Foil Bag

Frozen spaghetti and meat sauce is being packaged in an unusual aluminum foil bag by Suss's Restaurant of Oklahoma City.

The heat-and-eat item comes in an aluminum foil bag placed in a rectangular paper carton over-wrapped with printed foil.

Bag is sealed on three sides. One end is left open. Fourteen ounces of spaghetti filled into the bag reach only half way so that the open end may be folded several times to form the protective seal.

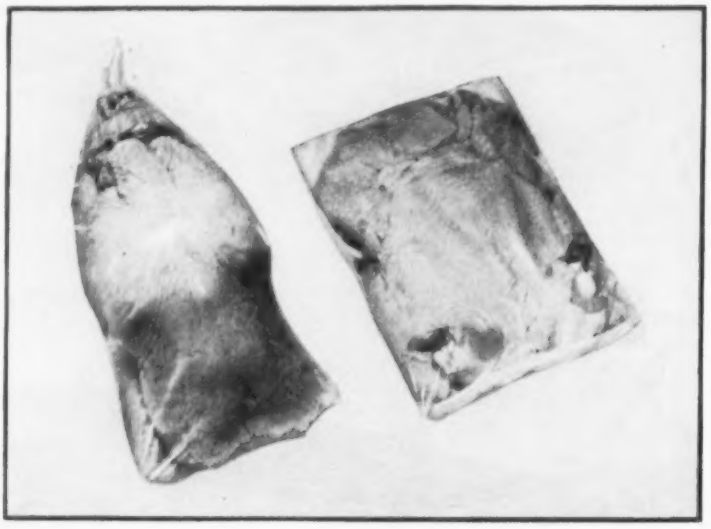
Housewife unfolds the bag and places it in boiling water, the unsealed end protruding above the water level to form a steam vent.

Aluminum foil is by Reynolds Metals Co.

Circle 20A on Reader Service Card

Cocktail Snack Kit

Recently introduced by Armour & Co. is a Cocktail Snack package containing tubes of Wisconsin Cheddar cheese and colored toothpicks. The cheese and picks are separated by a transverse seal. Package is a plastic film pouch.



Tight, effective poultry packages with

Self-Molding Plastic Film

Latest packaging development to come from the laboratories of Shellmar-Betner Division of Continental Can Co. is Flex-on. A self-molding polyethylene film, the new product permits tight fit poultry packaging for both whole and cut up birds by means of a cold packaging method that keeps bacterial count at a minimum, and sparks appetite appeal.

Flex-on offers several important advantages to poultry packers. It forms a neat package without heating and increasing the surface temperature of the birds. It breathes and passes any CO_2 which may have generated in the package: it offers a speedy low cost packaging method which can wrap ten-fifteen birds in a minute. It stands ice shipment: and it offers a consumer package which presents the poultry looking fresh, plump and uniform in size and shape.

Eliminates Heat Shrinking

Instead of heat shrinking the film on the tray pack or carcass of the bird, the new method stretches the polyethylene tightly over the tray pack and then places the whole bird in a bag that is first expanded and then allowed to collapse over the carcass.

This cold packaging is a big advantage in that it keeps table quality of the poultry at a high level by cutting bacteria counts and eliminating the need for personnel in the plant to work in a steam laden atmosphere.

Complete transparency of the new film shows off the natural bloom of the poultry to best advantage. Elimination of vacuum cuts the problem of seepage and insures that the poultry will retain its shape. Shelf life of poultry packaged in Flex-on is at least 10 days more when the product is acronized.

Machinery for packaging tray packs includes a dispenser, into which the film is fed in rolls, which automatically cuts off the proper amount for a package and presents the top edge of the next sheet in a proper position. Dispenser is designed to be used in combination with a Great Lakes heat sealer. Total equipment investment is only $500.

For whole bird packaging Flex-on bags are automatically opened on an air powered horn which permits packaging of 10-15 birds per minute, depending upon the dexterity of the operator. The horn, costing $375, does not involve a motor or an electrical power.

Circle 20B on Reader Service

Tide has a reason...

These 1¾-oz. packets of Tide's "washday miracle" just fit South American housewives' needs. For packaging these small quantities at high speeds, Procter & Gamble uses Riegel's economical, heat-sealing Pouch paper... to protect against moisture, mildew, and the scuffs of overseas travel... to keep that shining "sell from the shelf." It's another proof that *protected by Riegel* means more:

Product protection always, plus flexible packaging materials that are

. . . tailored to run at high speed on automatic machines

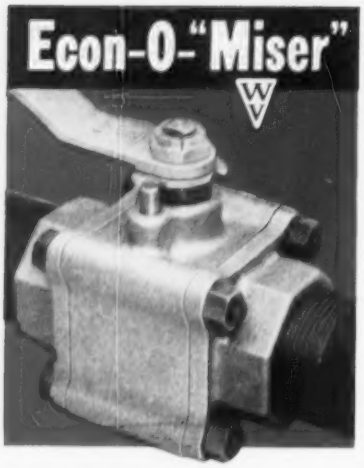
. . . made to your own specifications, printed, waxed, coated, and laminated combinations of all types

. . . packaging materials that are made right, run right, and priced right

Hundreds of today's best-sellers benefit from Riegel's uniformly effective system of product protection. You can, too.
Write Riegel Paper Corporation, 260 Madison Avenue, New York 16.

Riegel
PROTECTIVE PACKAGING MATERIALS

Tide export packages are protected by special Riegel lacquer-coated pouch paper, tailor-made to heat-seal at high speed on Transwrap machines.



Worcester's New Econ-O-"Miser" Ball Valve* is BOTH

VALVE and UNION

The costs of a union and installing it are eliminated. Add to this the longer operating life of the Econ-O-"Miser", the time and materials savings of *in-line maintenance*, and you get performance unmatched by *any* valve at *any* price.

The Econ-O-"Miser" is available in Bronze, Aluminum, Aluminum Bronze, Forged Carbon Steel, types 303 and 316 Stainless Steel. Seat and seal materials available: Teflon, Buna-N and Neoprene (others available on request.)

The many combinations of body and seat seal materials allow handling of exceptionally wide range of media.

Other Outstanding Features

- Compact for ease of installation
- Positive leakproof shut-off
- **In-line maintenance** permits quick, easy inexpensive repairs
- Two-way flow allows application of pressure or vacuum to either side of valve
- Quarter turn operation — readily adaptable to remote control
- Visual determination of OPEN — CLOSED positions — No manual check needed
- Round flow through the valve — minimum pressure loss and turbulence
- "Wiper-action" of resilient seat against ball eliminates abrasive wear due to foreign materials in media . . . assures leak-proof seal . . . long operating life

* Pat. Pending

Write for full particulars

WORCESTER VALVE CO., Inc.

18 Parker Street, Worcester, Mass.

Packages & Products

Flip-Open Cap

A flick of the finger opens a new ketchup bottle cap made by Aluminum Co. of America. Dubbed "Flavor-Lok", the aluminum closure combines convenience with positive seal.

The cap is tailor-made for each bottle, since the plain-sided skirt of the closure is rolled onto the bottle threads after filling and capping. This insures perfect fit and the high vacuum seal necessary in ketchup packaging.

Glass for the new cap carries a triple thread. Turning the cap a one-third turn removes it. The glass thread is considerably shorter than that now utilizes on standard closures.

Slight alterations on existing sealing machinery are reported to make possible an easy switch to the new cap.

Circle 22A on Reader Service Card

ALUMINUM FOIL packets hold portion serving of Single Serv jelly, mustard, ketchup, and table syrup. Processed by Nu-Way Foods Co., Atlanta, Ga., the packets feature easy "tear and squeeze" dispensing, high product protection, and a very strong eye-appeal.

HAMBURGER SEASONING is blend of 17 seasonings, dextrose, MSG. The 3⅞ ounce jar is packaged by R. C. Bigelow, Inc., Norwalk, Connecticut.

Revamped Milk Can

Redesigned by Jim Nash Associates, New York, leading package and industrial design firm, is the Borden Company's sparkling new instant malted milk package.

Shown above are the former design (left) and the new design (right). The new package stresses the special features of the improved formula by emphasizing the words "new" and "instant" in yellow letters against a dark blue field. The words "Double Malted" are placed near the brand name logotype to emphasize this feature of the formula.

Surface design for Borden's Instant Hemo for overseas sale has undergone a change as part of the packaging program being carried out by Jim Nash Associates, New York. The package, a vacuum can, utilizes the same design elements as the tall, pry-open can for domestic markets.

Feature of the design is a picture of a glass of cold Hemo and a cup of hot Hemo. The familiar Borden Elsie trademark is utilized.

Circle 22B on Reader Service Card

These apples are being stacked higher than ever before, thanks to Gaylord boxes designed to meet special cold storage conditions.

BOXES STACKED TO THE ROOF SAVE MONEY

...but you cannot stack them to the roof unless you have boxes that will take high-stack pressure. The more difficult your problem, the more important it is to get the right kind of boxes.

If you think that unusually tough box requirements limit your stacking height, let Gaylord tackle the job. Call your nearby Gaylord packaging engineer.

Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS
KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

For more data, circle this page number on card at back →

THE BIG DIFFERENCE IN SPRAY DRIED FLAVORS IS RIGHT HERE

Spray dried, locked in flavors
are nothing more than tiny globules
of concentrated flavor encased in an outer
protective coating which shields it from oxidation,
evaporation and the reaction with other ingredients
which it might contact.
The superiority of FRITZSCHE'S AROMALOK* FLAVORS
is due simply to the fact
that *this core or nucleus is composed of*
the very finest flavoring ingredients made.

AROMALOK*

FLAVORS for use in:

While spray dried flavors are a trifle costlier
than their liquid equivalents,
they offer advantages in certain applications
which can more than offset this difference.
Assured indefinite shelf life and protected
against flavor loss during manufacture
the tendency toward costly overflavoring
is thus avoided. Furthermore,
spray dried flavors are easy to handle and store.
They mix readily and will not separate in the
finished product. They are highly recommended
for use in all powdered products
where flavor retention is a prime consideration.

- SOFT DRINK POWDERS
- GELATIN DESSERT POWDERS
- PUDDING POWDERS
- CAKE MIXES
- ICING MIXES
- ICE CREAM MIXES
- SHERBET and WATER ICE MIXES
- PIE FILLER MIXES
- MILK DRINK POWDERS
- CHEWING GUM
- COMPRESSED CONFECTIONS
- PHARMACEUTICAL TABLETS
- TOOTH POWDERS

FRITZSCHE *Established* 1871 *Brothers, Inc.*

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F.* FACTORY: *Clifton, N. J.*

Let us submit an
AROMALOK* FLAVOR
for your product.

*Reg. Trademark

ICED TEA MIX is packaged in apothecary jar. Called Frosty Lemon it is tea mixed with lemon peel, spices. Packer is Twin Trees Gardens, Inc., Lynbrook, New York.

Foil in Six Colors

Frozen whole green beans processed by Seabrook Farms are being presented to consumers in glittering aluminum foil overwraps, attractively printed in six colors. This is Seabrook's first use of foil for packaging.

The 9-oz. package consists of a waxed carton overwrapped with Reyseal, printed and produced by Reynolds Metals Co.

Circle 25A on Reader Service Card

New Plastic Film Tape

A new pressure-sensitive plastic film tape called Kylon is being produced by Mystik Adhesive Products, Inc.

Similar in appearance and application to conventional cellophane tapes, Kylon is available in both transparent and opaque finishes. Its impact resistance is reported to be

NEW!

for sorting
packaged items
by weight . . .

Basic Weight Classifier

Exact Weight's new Basic Classifier, employing Shadowgraph Scales with photocell controls, provides light signals which indicate correct weight, or over or under within pre-set limits. Products or packages are classified into weight groups with accuracy increased far beyond the scope of visual sensitivity. Any number of classifications can be obtained, from 2 to 128, and items of any shape or size can be handled in a capacity range from 2000 milligrams to 100 pounds.

The control system not only provides light signals, it may be used to actuate automatic transfer mechanisms, chart recorders for statistical and quality control; and to operate counters or alarm signals. Write for Bulletins 3333 and 3347.

See the new Exact Weight Basic Classifier demonstrated at booths 1371–1373, National Chemical Exposition, New York Coliseum, December 2nd through 6th.

Exact Weight SCALES

Find us in your local 'Yellow Pages'

Sales and Service Coast to Coast

THE EXACT WEIGHT SCALE CO.
910 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: P.O. Box 179, Station S, Toronto 18, Ont.

BETTER QUALITY CONTROL . . . BETTER COST CONTROL

be sure

you match pumping

Efficiency

to the job...

Maximum head and delivery as compared to power consumed are the big factors in pumping efficiency. So regardless of the type of pumping job you have, you want a unit that gives the best results. You can't go wrong when you specify an Ingersoll-Rand Motorpump . . . available in a wide range of models from ¼ through 75 horsepower . . . capacities to 2800 gallons per minute . . . heads to 650 feet.

Motorpumps are compact, easy to install units with a versatility of mounting positions. Full details on I-R Motorpumps will be furnished promptly by your nearby Ingersoll-Rand branch office, or write direct for the latest catalog.

MOTORPUMP

by

Ingersoll-Rand

11 Broadway, New York 4, N.Y.

9-670

Packages & Products

nine times higher than that of standard tapes. It will adhere to damp surfaces and retains the same tensile strength after prolonged soaking according to Mystik.

Tensile strength is registered at 22 lb. per in. of width. Water absorption is reported not to exceed a maximum of 0.05%.

Kylon maintains optimum adhesion at operating temperatures from 122 deg. to 140 deg. F. and can resist temperatures up to 180 deg. for extended periods.

Circle 25B on Reader Service Card

Expanding Junior's Menu

Youngsters in the Junior Baby Food feeding age can now enjoy one of their parents' favorite dinners—spaghetti, tomato sauce and meat.

H. J. Heinz Co. has announced distribution of its Junior spaghetti dinner to food stores nationally. The product is one of several adult dishes being tailored to meet the nutritional need of toddlers in the Junior feeding age.

The aim of Heinz, according to B. H. Anderson, product manager, is the addition of variety and nutritional value to the diet of youngsters.

Also made available for baby are Heinz strained potatoes. Still another item is eggs and bacon.

Vacuum Meat Pack

Recently adopted by three well-known meat-packing firms is Marathon Corporation's ADVAC luncheon-meat package. The package is a folder-type package which frames the cellophane wrapped luncheon meat with colorfully printed brand and product identification. Printed back panel offers menu suggestions.

Processors now using the package are Christman Sausage Co., Parrot Packing Co., and the Jones Sausage Co.

Circle 26A on Reader Service Card

B.F.Goodrich report:

Even fat from the fish fry can't damage a Koroseal belt

Photo courtesy of O'Donnell-Usen Fisheries Corp., Gloucester, Mass.

B.F.Goodrich improvements brought extra savings

Problem: Nearly a million fish sticks a day ride that conveyor belt from the fryer to packing tables. Conveyor belts made of canvas or rubber used to be used on jobs like this. But there were problems. The warm cooking oil on the sticks soaked into the belt, made it hard to keep clean. Worse still, the oil made some belts get soft and sticky; it made others harden and crack.

What was done: The B.F.Goodrich distributor recommended a Koroseal belt when the fish stick processor opened a new plant. Because it's made of Koroseal flexible material, this belt stands grease, cooking oil, most acids—and just about everything else that ruins other belts. It resists cracking and peeling, never gets soft or sticky. There's no danger of contamination with Koroseal because it has no odor, no taste, never gets rancid.

Savings: Since cooking oil can't soak into Koroseal's smooth surface, the belt is a cinch to clean. Just a wipe with a damp cloth and detergent, and the B.F.Goodrich belt is as clean as a china plate. After two years, the Koroseal belt you see here still looks like new, is expected to give many more years of service.

Where to buy: Your B.F.Goodrich distributor has the exact specifications on the Koroseal belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about the many kinds of belting, hose, gloves, and protective clothing which B.F. Goodrich makes for the food processing industry. *B.F.Goodrich Industrial Products Company, Dept. M-184, Akron 18, Ohio.*

Koroseal—T.M. Reg. U. S. Pat. Off.

B.F.Goodrich
INDUSTRIAL PRODUCTS

For more data, circle this page number on card at back →

50 years
OF PROGRESS

in Brockway quality control

Brockway QUALITY CONTROL is your best assurance against costly packaging and handling of your product.

First of all, Brockway glass containers are made from controlled materials only . . . and from that point on the most rigid control is exercised by continual measurement of all physical properties.

Individual containers are placed under the most exhaustive physical tests and visual inspection including the most advanced techniques of single line electronic selection.

This is the kind of QUALITY CONTROL that assures uniformity and structural strength to meet the demands of modern packaging methods . . . QUALITY CONTROL that assures packaging efficiency and low cost handling.

Nowhere is this more important than in the packaging of Foods.

BROCKWAY GLASS
COMPANY, INC.

BROCKWAY, PENNSYLVANIA
Sales Offices in Principal Cities
Subsidiary:
Demuth Glass Works, Inc., Parkersburg, W. Va.

Plants: BROCKWAY, PA. • CRENSHAW, PA. • FREEHOLD, N. J. • LAPEL, IND. • MUSKOGEE, OKLA.

Packages & Products

PROMOTIONAL tie-in between beer and pretzels is boosting sales for Falstaff Brewery of St. Louis. Small white foil bags holding Rold Gold pretzels, bear the Falstaff trademark. The packages of pretzels are used as give-aways during tours of the Missouri Brewery and are given to private organizations ordering beer for their parties. Bags are by Milprint, Inc.

Circle 29A on Reader Service Card

New Product Shorts

Quick fudge mix has been introduced under Junket label. Twelve ounce package holds either cocoanut, penuche, or chocolate. It is heated with butter and water to prepare.

Carton has replaced bags in General Mills Institutional Baking Mix line.

Low sodium cheese has been introduced by Swift & Company under Gold Crest label. Now in national distribution is an 8-oz. consumer package.

Blueberry-Rhubarb blend called "Blubarb" has been developed by USDA Scientists at Puyallup, Washington.

Latest additions to Swift & Company heat-and-eat line are meat balls with tomato sauce, chicken a la king, chicken and dumplings, sliced beef and gravy, Swiss steak with gravy, and turkey with dressing. Each serves two-three persons.

New juices for baby—orange-pineapple and pineapple-grapefruit—are latest Gerber Baby Foods items.

Frozen shrimp are being offered by Kaptain Krusty in 7 oz. and 1¼ lb. sizes. Shrimps are peeled and deveined.

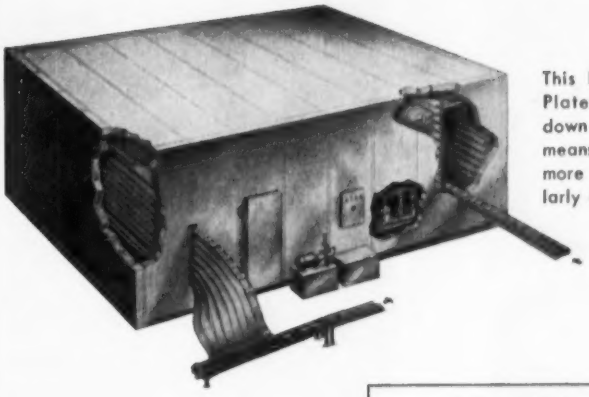
Instant Hollandaise sauce mix is being marketed by Maison Julien, Inc., New York City. Eight ounce jar makes 40 servings.

Frozen stuffed green peppers in Creole sauce have been introduced in Topco Associates' Dartmouth brand line of Frozen Foods.

PERFORMANCE IN FOOD PROCESSING —GUARANTEED BY PROCTOR

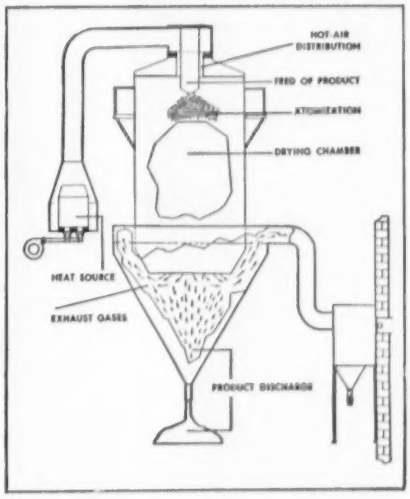
From −55°F. to 240°F. For Liquids, for Solids.

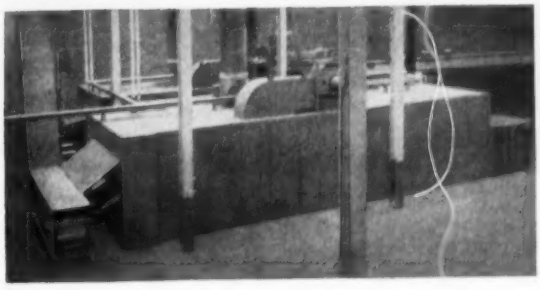
Every Proctor product for the Food and Process Industries carries the famous Proctor performance guarantee, based on wide experience and a careful analysis of product requirements. Proctor's new Continuous Plate Freezer too, is guaranteed for the same high production rates and top product quality—it too features the same reliability, the same operating economies, the same product uniformity found in all Proctor products.



This Proctor Continuous Plate Freezer operates down to −55° F.! This means quicker freezing, more production of regularly shaped packages.

Proctor Spray Dryers are designed and built to suit the requirements of your product—from pilot plant scale to large production units.





Proctor Drying Ranges are built to achieve uniform drying—the key to product quality.

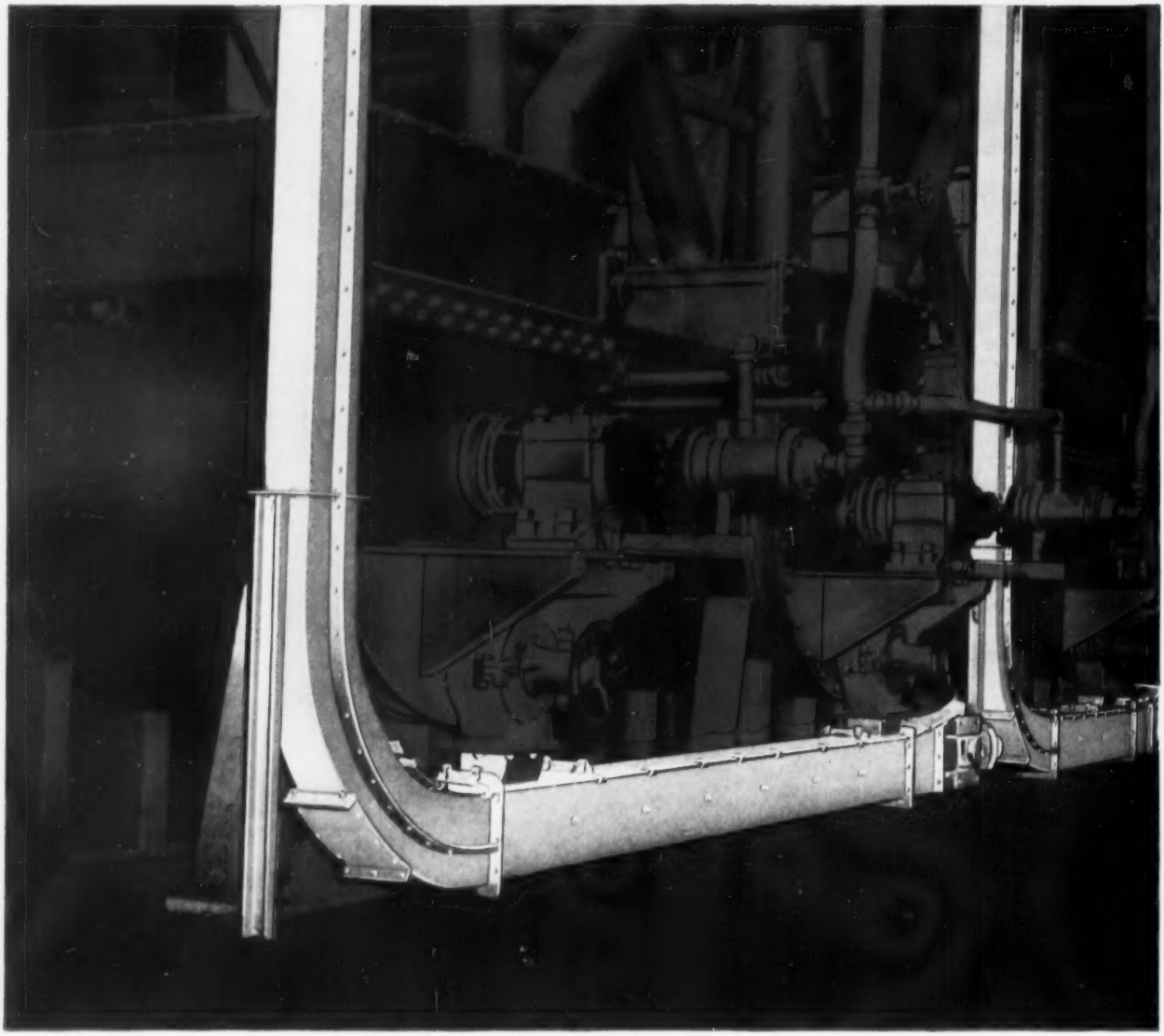
PROCTOR & SCHWARTZ, INC.

PHILADELPHIA 20, PA.

Proctor

STEPHENS-

for biggest cost reduction



BELT CONVEYORS

VIBRATING CONVEYORS

REDLER
CONVEYORS, ELEVATORS

ZIPPER
CONVEYOR-ELEVATORS

PAN CONVEYORS

BUCKET
ELEVATORS

BIN GATES—
ALL KINDS

← For more data, circle this page number on card at back

-ADAMSON

improve your bulk food conveying systems

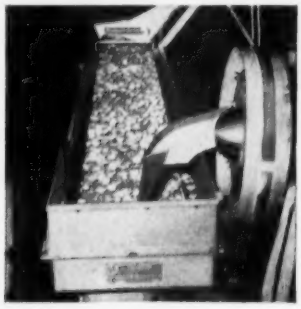
Two L-type REDLER conveyor-elevators handle powdered dextrine for Penick and Ford, Ltd., Cedar Rapids, Iowa. The REDLER type enclosed conveyor was developed exclusively in the U. S. by STEPHENS-ADAMSON.

Take a good look at your material handling cost—it's your largest single item of overhead. The straight road to reducing this cost is mechanization on your production line.

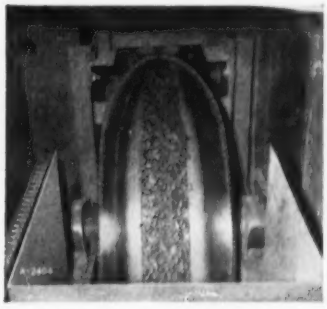
The benefits from a scientifically designed bulk materials conveyor system, for example, can be far reaching. They include things like improved product flow, swifter processing, space conservation, elimination of oversize inventories, and improved employee morale.

STEPHENS-ADAMSON can mechanize your food handling procedures by (1) working in close cooperation with your plant engineers, (2) by working independently on both engineering and installation assignments and (3) by drawing from a great variety of standardized conveying products which are manufactured in three strategically located plants.

Call the STEPHENS-ADAMSON district office in your area for a complete analysis of your bulk material handling requirements. When you do you'll take a long step toward lower production cost.



A food slice separating conveyor is used by a midwest processor to move and screen out undersize pickle slices. The installation tremendously speeds up what was once a very time consuming operation, at the same time cutting manpower requirements.



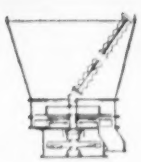
Zipper belt conveyors find many adaptations in the food processing industry. At A. N. Stollwerk, Inc., Camden, N. J., raw cocoa beans are mechanically handled by zipper, insuring clean, dust free transit, eliminating bean breakage and manual handling of heavy bags.

SINCE 1901 S-A STEPHENS ADAMSON MFG. CO.

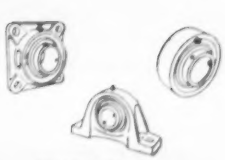
STEPHENS-ADAMSON MFG. CO.

6 RIDGEWAY AVENUE, AURORA, ILLINOIS
LOS ANGELES, CALIFORNIA
BELLEVILLE, ONTARIO

VIBRATING SCREENS



CIRCULAR BIN DISCHARGERS



SEALMASTER BALL BEARING UNITS

S-A manufactures a wide range of material handling products in three complete plants in U. S. and Canada.

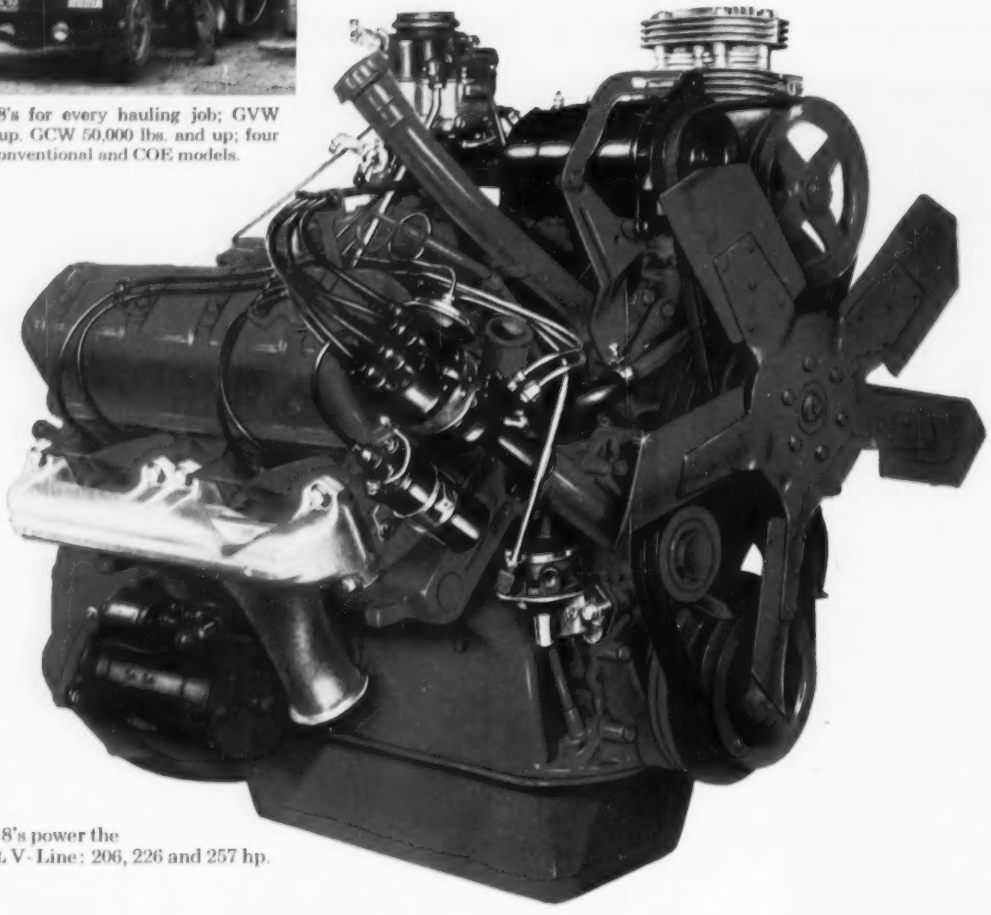
- Belt Conveyors
- Belt, Pan & Plate Feeders
- Ship Loading Boom Conveyors
- Stacking Conveyors
- Storage & Reclaiming Systems
- "Natural Frequency" Vibrating Conveyors
- REDLER Conveyor-Elevators
- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
- Headshaft Holdbacks
- Grizzlies & Screens
- Centrifugal Pilers
- Bin Gates & Tunnel Gates
- Car Pullers & Spotters
- Bucket Elevators
- Skip Hoists
- SEALMASTER Ball Bearing Units

• *Write for a bulletin on any of the above products.*

For more data, circle this page number on card at back →

Heavy-duty V-8's for every hauling job; GVW 24,000 lbs. and up. GCW 50,000 lbs. and up; four and six-wheel; conventional and COE models.

Most GO under any truck hood!



Three great V-8's power the INTERNATIONAL V-Line: 206, 226 and 257 hp.

INTERNATIONAL HEAVY-DUTY V-8's

Introduced last year—and smashing performance records ever since—INTERNATIONAL Heavy-Duty V-8's give you the most productive V-8 power in any truck.

Make more trips on short hauls! Save more time on long hauls! Faster acceleration, higher sustained speeds with far less shifting. More ton-miles per gallon, too!

INTERNATIONAL V-8's make more money for their users because they do what other trucks cannot. Get the facts today from your nearby INTERNATIONAL Truck Dealer or Branch. International Harvester Company, Chicago, Illinois.

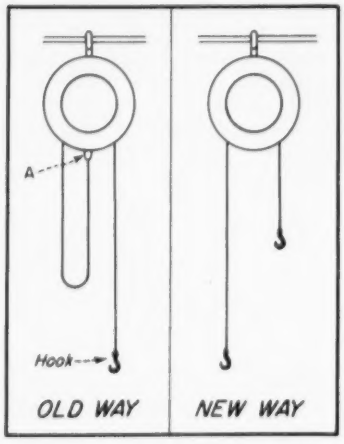
Motor Trucks, Crawler Tractors, Construction Equipment, McCormick® Farm Equipment and Farmall® Tractors

Fleet cost records prove

INTERNATIONAL® TRUCKS cost least to own!

Drilling, Cutting Tips

There are still occasions in maintenance and construction work when a ratchet drill and an "old man" (the catalog calls it a drilling post but your older mechanics will not recognize it by that name), or an elbow powered hacksaw, can do the job better, cheaper, and safer than a flame cutting torch. This is especially true when you include the cost of providing proper fire prevention and getting the torch equipment to and from the job or vice versa.—*Technical Bulletin, General Foods Corp., White Plains, N. Y.*

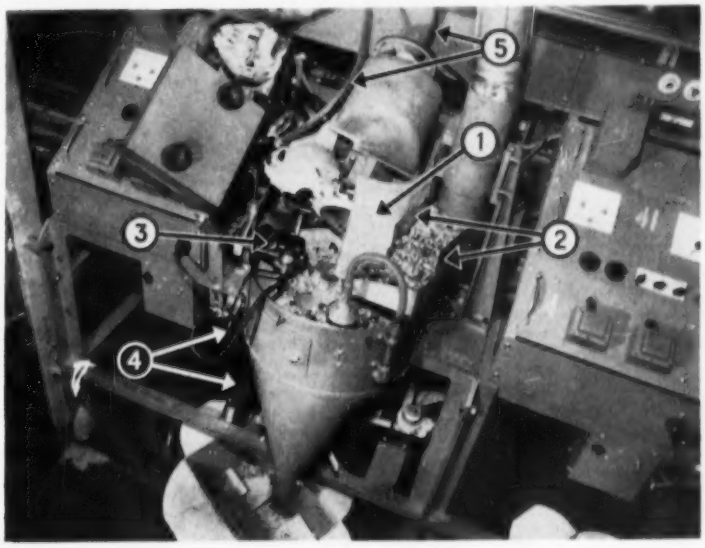


Hoist Does Double Duty

A simple improvement on an electric hoist enabled us to make more efficient use of our manpower.

As originally installed (old way in above sketch) a hook was fastened to one end of the chain while the other end (A) was secured to the motor frame. The hoist was installed on the third floor. And raising and lowering were slow inasmuch as the hook had to move up and down.

But by removing end (A) from the frame and securing a hook to it (new way) a more versatile machine was developed. Now, with two hooks in use we can unload one on the third floor while the other is being loaded on the first. Every movement of the chain is a load-carrying one.—*S. C. Morey, Syracuse, N. Y.*



Improves Electronic Sorting Machines

In order to efficiently color sort walnut meats we had to make numerous changes in our Electronic Sorting machines at Diamond Walnut Growers, Inc., Stockton, Calif. The corrugations, irregular shapes, sizes, and fines of nut meats all contributed to the need for these alterations. Here are six of the improvements:

▶1. Vacuum fingers that hold nutmeats for passing under the photocell would often pick meats from the basket but would be unable to hold them securely because of the irregular surfaces. As the drum turned some of these meats were thrown on the floor. A curtain we devised (1 in photo) is hung on a rod (8 in. long x ⅛ in. x ¼ in.) and now deflects nuts back into the basket.

▶2. Guides (metal strips not visible in photo) on each side of the vacuum drum effectively orient nut meats held by the vacuum fingers so that they present the best possible view to the electric eye.

▶3. To prevent overflow of the shaker feed at the 90-175 lb. per hr. throughput rate, metal extensions (2) were added to the sides. At the same time, we redesigned the feed for one-screw-removal for cleaning.

▶4. Though the basket rpm. is not high, enough centrifugal force is developed to throw meats against the side-shell of the machine. And they would often drop between the shell and basket, through the conical discharge hopper and into a box on the floor. A metal rim (3) that fits closely around the periphery of the basket obviated the problem.

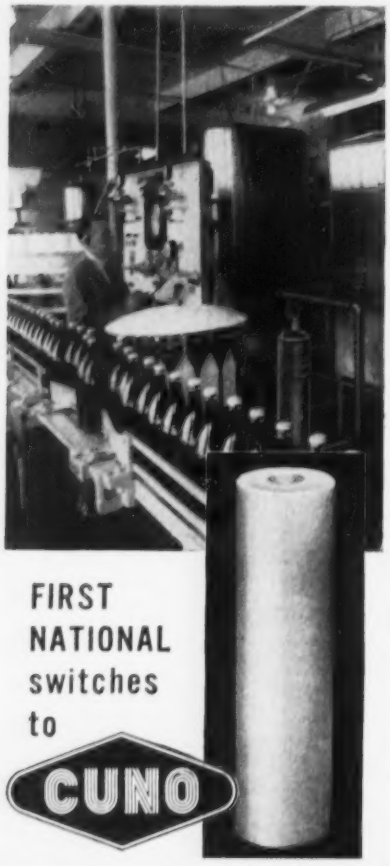
▶5. Taking a sample from an original ESM meant stooping and reaching under a lever and in back of the machine to divert meats from the main discharge chutes into sample tubes (one for meats of acceptable color, one for all other meats).

Levers for both tubes were connected to a longer handle (4) that reached the front of the machine. By pulling this lever both samples are delivered at once, but can be caught separately for inspection.

▶6. Fines caused gears to bind. They also gathered on the glass cover of the photoelectric cell, reducing its efficiency to where it sometimes was inoperative. A shield over the vacuum drum drive gear protects it from fines. And two compressed air lines with terminal jets (5) are aimed at the glass covers to keep them free of accumulation. These lines are normally under 5 psi., but pressure is periodically raised to 30 psi. to remove stubborn accumulations.—*G. D. Arnell, Sr., 5708 Cherokee Lane, Stockton, Calif.*

CUT OUT AND FILE

FILTERING WATER for carbonated beverages...



FIRST NATIONAL switches to CUNO

MICRO-KLEAN FILTERS

"... Filter changes reduced more than 500%"

"... and, in addition, we're sure of a sparkling clear beverage." This statement by the Assistant Superintendent of the Beverage Bottling Department sums up the benefits that the new, white cellulose Cuno Micro-Klean Filter Cartridge brought to the First National Stores' East Hartford, Connecticut plant. If *your* filtration requirements include purity, clarity and complete freedom from any filter-imparted taste, Micro-Klean can bring similar important benefits to your food-processing operations.

WRITE NOW FOR COMPLETE INFORMATION ... ask for your free copy of Catalog No. 53-100.

FOR COMPLETE APPLICATION ENGINEERING SERVICE ... contact the Cuno Field Engineer conveniently located in your area.

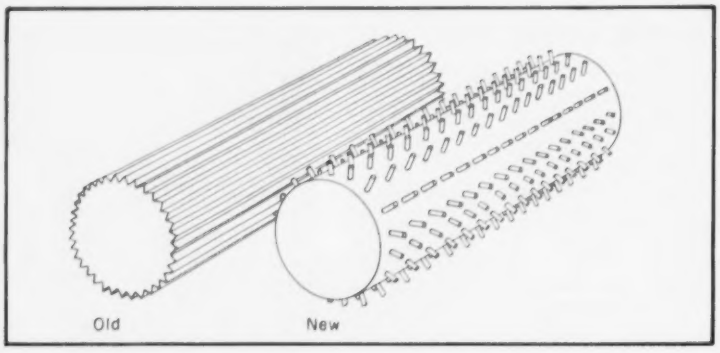
CUNO

CUNO ENGINEERING CORPORATION

24011 South Vine Street, Meriden, Conn.

Filtration Engineers in Principal Cities

Practical Ideas

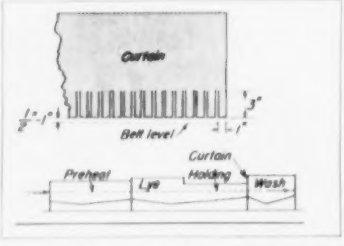


Better Block-Breaking Roll

During the peak season many of our vegetables are frozen in bulk. Throughout the year, whenever we package bulk-frozen produce it becomes necessary to break up the large frozen blocks into smaller units that can be easily handled by the carton filler.

Formerly we used a roller with longitudinal grooves (see left sketch) for this purpose. However, this type of roller sometimes resulted in crushed vegetables.

Now, however, we have a roll with rows of steel rods brazed on (see right sketch). This has proved to be ideal—breaking lumps into distinct individual vegetable particles, and without mashing any product. — *Webster McAllen, Plant Superintendent, Costal Foods Co., Cambridge, Md.*



Curtain Improves Lye Peeling

Efficiency of lye peelers for freestone peaches may be greatly increased by placing a light rubber or canvas sheet just ahead of the washing sprays.

Lower edge of the sheet is cut into 1-in. wide fingers and its height adjusted so that the fingers touch the backs of peaches as they emerge from the holding section of the peeler. The skins that have been softened by the lye, are loosened by contact with the fingers and are more easily removed by the water sprays.

The sheet has added pluses, too. Spray pressure may be reduced from the conventional 10-15 psi. to 3-5

CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in ten.

Also $5 to $15 (sometimes even more) is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. —The Editors.

AUGUST PRACTICAL IDEA WINNER was "Waterjet-Elevator Discharges Product," sent in by W. H. Fortuin, General Manager, N.V. v/h W. Hoogenstraaten & Co., Alkmaar, Holland. (Winners are chosen by Readex, a foremost outside survey agency that regularly polls many scores of FE readers throughout the country.)

NEW LIFT... LONGER LIFE FOR YOUR PRODUCTS WITH FIRMENICH POWDERED FLAVORS

New and improved techniques of process drying, exclusively employed by Firmenich, yield powdered flavors that flow freely, are dust free, and give you the finest precision in flavoring your products. These important developments in quality flavoring will improve the taste appeal of your products . . . extend their shelf life . . . give them package-to-package uniformity that captures customer preference. Samples of Firmenich Powdered Flavors, with technical information on their practical application, on request.

FIRMENICH INCORPORATED

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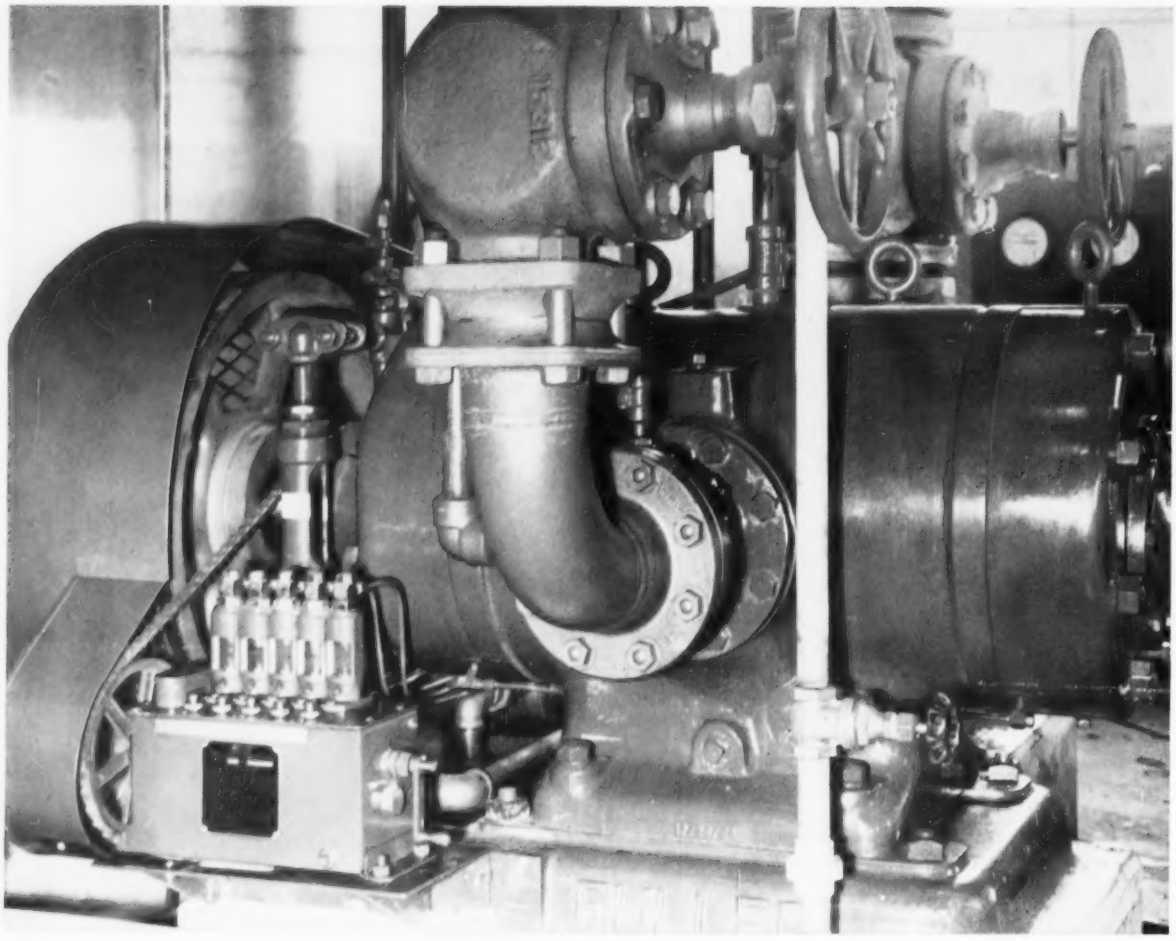
GENEVA · PARIS · LONDON



HOW ONE FOOD PLANT INCREASED OUTPUT 50%

Increasing demands for Morton Pies created a production problem at Morton Frozen Foods Eastern Plant at Crozet, Virginia. The solution was installation of a new freezing tunnel and relocation of processing equipment. To provide the necessary power two Fes-Fuller Rotary Booster Compressors were added.

In addition, power for the new 85 ton freezer storage is now handled by a two-stage compressor system employing a Fes-Fuller Rotary Booster. A capacity reducer on this Booster plus a close connection of the high stage suction with smaller machines permits variation in capacity to fulfill required load changes.

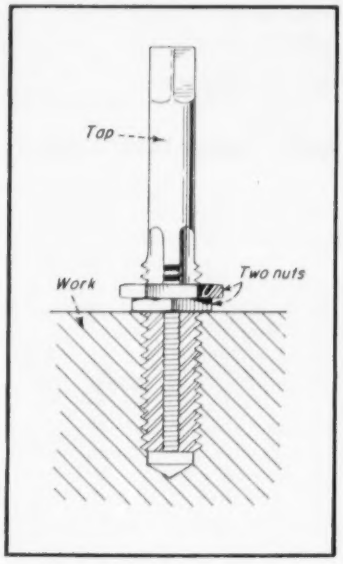
Like so many other food freezing plants, Morton Packing has found Fes-Fuller equipment to be reliable under all conditions and require a minimum of maintenance. When you need increased refrigeration facilities, it will pay you to investigate the economical and reliable Fes-Fuller Rotary Booster Compressor Systems.

FES FULLER

C-313
4694

FREEZING EQUIPMENT SALES, INC., 1405 N. DUKE Street, YORK, PENNA.
Qualified distributors in principal cities
LOW TEMPERATURE FREEZING EQUIPMENT

psi. with a resulting saving in water consumption, and an increase in percentage of perfectly peeled fruit. Also, the reduced pressure produces fewer peaches with roughened surfaces resulting in a better appearing canned product.—*J. A. Kitson, Chemistry Div., Dept. of Agriculture, Summerland, B. C.*



Tap Depth Safety Stop

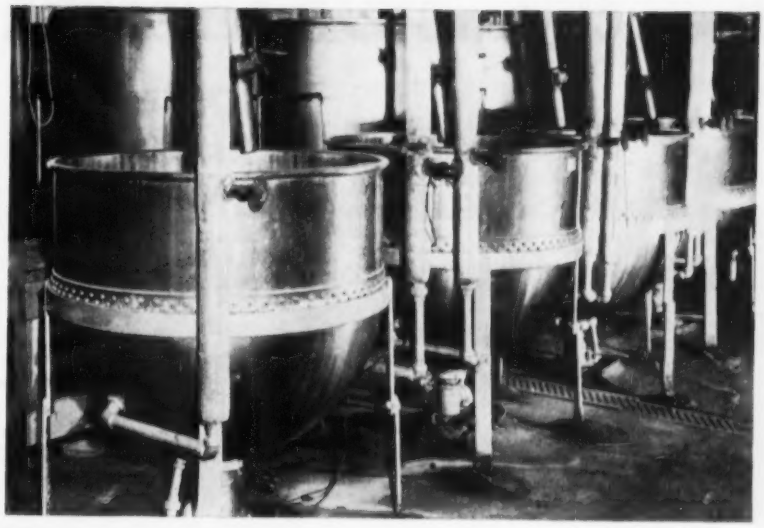
When tapping a hole a depth stop on the tap can insure against ramming it against the hole bottom and causing it to break. The stop is also an aid in getting correct depth of full thread.

The depth control can be made from a pair of thin nuts locked together on the tap thread (see sketch). The nuts are made from standard lock nuts faced off to reduce their thickness by half.

On duplicate threaded holes, the correct depth of full thread is assured by screwing the tap down until the nuts make contact with the upper face of the work.

Excessive resistance to tap turning before the nuts have reached their full depth can indicate a shallow hole. The tap can be screwed out and hole depth inspected.—*C. T. Bower, Tool Engineer, London, England.*

Ending Monday-Absenteeism: If your plant has a high Monday-absenteeism rate here's a way to improve the situation. Make Monday payday.



How would you clean 40 of these kettles?

This midwest food packer had to remove burned-on deposits daily from a battery of forty steam-jacketed cookers used in preparing catsup, baby foods, jellies. Nickel surfaces were etched and rough to the touch, so the carbon film really latched on. He had other troubles, too—burned-on tomato residue in his stainless steel lines, copper heating coils, scalders. It seemed that scraping, brushing and swabbing, hour after hour, was the only answer.

. . . until his local Oakite Technical Service Representative suggested circulating a solution of Oakite Composition No. 62, a heavy-duty detergent just made for the job.

Things are different now—and Oakite 62 made the difference. No scraping, practically no brushing. Kettles and lines cleaner than ever, at a big saving in time, money and muscle.

It's a typical case. First, the Oakite man picked exactly the right material, then figured out the best concentration and temperature for the job. He stayed with the work to the finish . . . even came around next day to double check.

If you have a cleaning problem of any kind, call your local Oakite man. Meanwhile, write for FREE booklet, just published, on food plant sanitation. Address: Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division
Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

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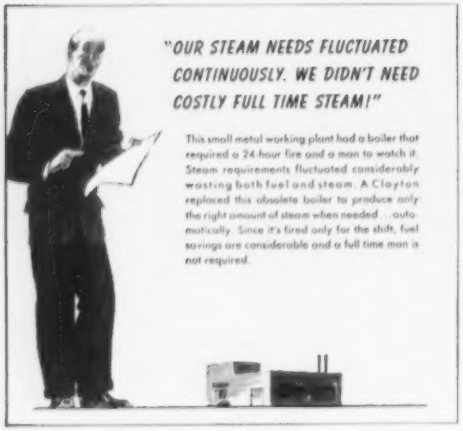
How a Clayton STEAM GENERATOR

"WE WERE FACED WITH AN OBSOLETE CENTRAL BOILER ROOM AND DETERIORATING TRANSMISSION LINES"

This well known chemical company had a sprawling plant with long transmission lines and condensation problems. Fluctuating steam needs throughout the plant made steam production a problem. The ordinary boiler had to be kept at full pressure all day . . . fired all night. Seven Clayton Generators strategically located now provide just the right amount of steam—when and where needed. They are shut down at night. These seven Clayton generators installed cost less than the cost of new transmission lines.

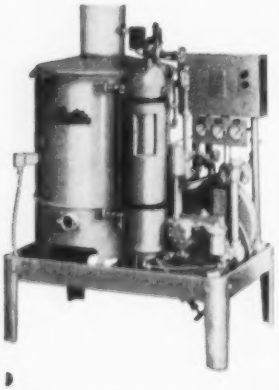


"OUR STEAM NEEDS FLUCTUATED CONTINUOUSLY. WE DIDN'T NEED COSTLY FULL TIME STEAM!"

This small metal working plant had a boiler that required a 24 hour fire and a man to watch it. Steam requirements fluctuated considerably wasting both fuel and steam. A Clayton replaced this obsolete boiler to produce only the right amount of steam when needed . . . automatically. Since it's fired only for the shift, fuel savings are considerable and a full time man is not required.

SOLVED THREE *different* STEAM PROBLEMS!

These actual case histories represent only a few of the reasons why smart business men buy Clayton Steam Generators. Basically the story is more steam at less cost in only one fourth the space occupied by ordinary steam boilers. They cost less to install too . . . no stacks to erect, no walls to knock out, lower rigging expense and lower hauling costs. The secret of Clayton's higher efficiency is *controlled circulation*—no space consuming straight tubes, but instead, a principle of using a coil without fired vessels . . . easier to operate and maintain. From a cold start, Claytons produce steam in 3 minutes. Let a Clayton representative give you the complete facts.



"IT WAS HOPELESS! WE NEEDED MORE STEAM AND WE DIDN'T HAVE ROOM FOR IT!"

Here was a well known beverage syrup company located in "midtown" squeezed in between buildings on all sides. To meet its additional steam needs, it went in only one direction . . . up! Since a Clayton produces the same amount of steam in only one fourth the space and weighs only a fraction as much as an ordinary boiler, it was relatively simple to put two Clayton steam generators on the roof! The installation was quick and inexpensive.

EXCLUSIVE!

Compare Clayton's 5-year published coil warranty covering material and labor.

Clayton MANUFACTURING COMPANY

Sirs:
Please send us more information on Clayton Steam Generators.

Name _____

Company _____

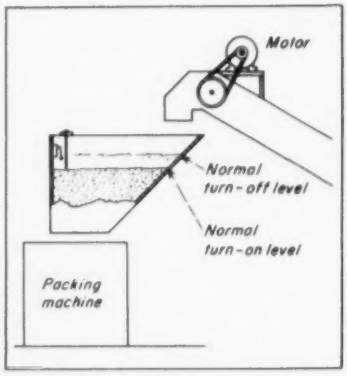
Address _____

City _____ Zone ____ State _____

We use steam for _____

Send to: **Clayton Manufacturing Company**
407 N. Temple City Blvd.
El Monte, California

Practical Ideas



Supply Hopper Level Control

The variation in level in the supply hopper caused some difficulty in the operation of our package filler.

We installed a normally closed Microswitch, type EZ2RL2 and suspended a pivoted piece of sheet metal in the hopper. As the level of the material being packaged rose in the hopper the material pushed against the switch thereby closing it. It also interrupted the circuit to the motor of the elevator which feeds the material into the hopper.

The spring-return operated plate swings away from the Microswitch as the level in the hopper drops. It again starts the motor of the elevator as supply to the hopper is needed.—*John J. Bushnell, Owner, Tigard Nut Packing Co., Tigard, Ore.*

Rolls Get Even Seed Layer

Poppy seeds are no longer hand sprinkled on egg-washed dinner rolls at Grable's Bakery, Miami, Fla. Considerable seed was lost this way, and the coating did not go on even.

The improved method uses a baker's pan partly filled with seed. The bottom of a second pan is then coated with about 3-oz. of shorten-

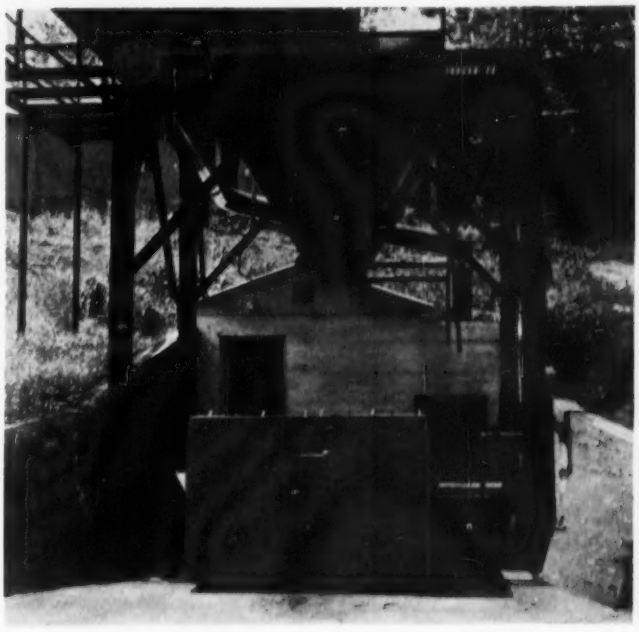
Stokely Van Camp

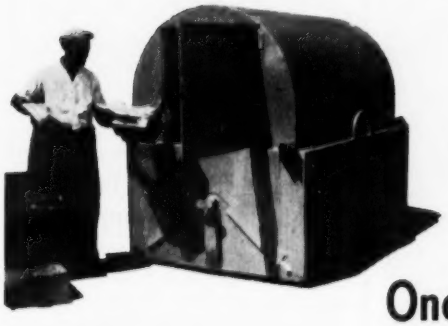
"CONTAINERIZES" Waste as It Accumulates

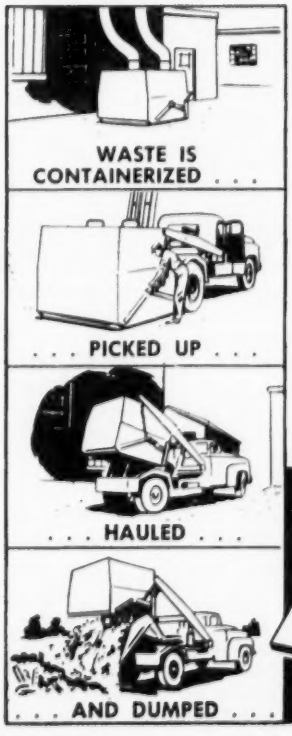
Newport, Tenn. Plant "Containerizes" Waste and Rubbish at 15 Accumulation Points . . . One-Man, One-Truck Dempster-Dumpster Handles All Collection and Disposal of Materials!

Container at right receives vegetable wastes from washer bins.

Container below is one of several used to collect rubbish.







One-Man Dempster-Dumpster System Serves Many Food Processing Plants

Keeping a food processing plant clean and free of fast-accumulating waste is a critical job . . . one that can't be economically handled by wheelbarrows, cans, bins or carts. Eliminate manual shoveling and rehandling as other industry leaders do by "*Containerizing*" waste, when and where it originates. The secret lies in clean, big-capacity Dempster-Dumpster containers at principal points of waste accumulation, periodically picked-up, hauled and emptied by one man and one truck-mounted Dempster-Dumpster.

The savings are obvious . . . food plants customarily amortizing their Dempster-Dumpster equipment investment in 18 months or less. If you're now using costly, obsolete methods of waste disposal, it will pay you to write for the booklet below.

FREE: Write Today for Your Copy of "How to Reduce Waste Disposal Costs"

DEMPSTER BROTHERS, Knoxville 17, Tenn., Dept. FE-11

THE DEMPSTER DUMPSTER® SYSTEM

To: Dempster Brothers, Dept FE-11
Knoxville, Tennessee

Please Send Without Obligation Your Booklet, "How to Reduce Waste Disposal Costs."

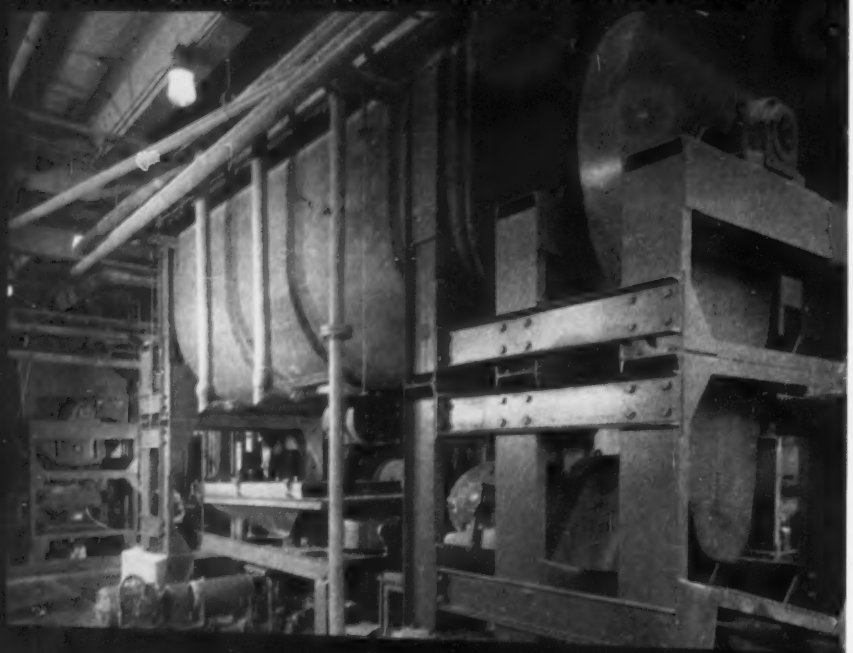
NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

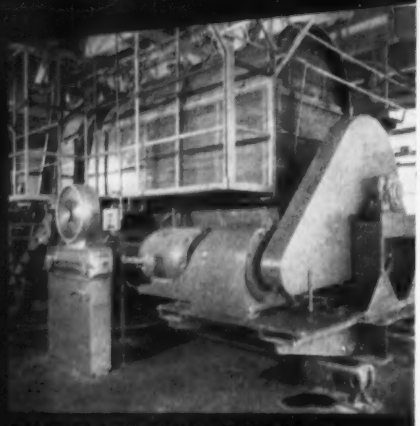
CITY ..... STATE .....

DAY Blender (Cooler), 10,000 lbs. capacity, discharging into one of two DAY Ro-Ball Sifters.



DAY installs blenders, sifters, acidifiers at CLINTON

World's largest mixer, built by DAY and used for blending dextrin, 60,000 lbs. capacity.



DAY wood tank acidifier, 10,000 lbs. capacity, scale mounted.

Clinton Corn Processing Company, a division of Standard Brands, Inc., Clinton, Iowa, has used DAY process equipment for years and has found it to be dependable and economical. Therefore, when equipping its new, modern plant, DAY blenders, sifters, coolers and acidifiers were again specified and installed.

If you make DAY process equipment your *first choice*, you, too, will produce a better product at real savings. Remember:—"Every day is a great day when you use DAY equipment". Why not write for a catalog now?

The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.

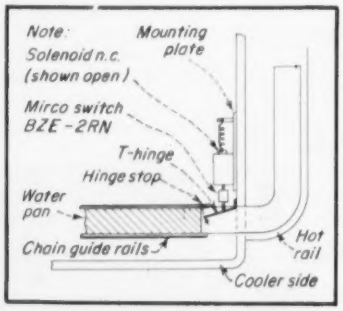
SERVING THE PROCESS INDUSTRY SINCE 1887
4924 BEECH STREET
CINCINNATI 12, OHIO

Practical Ideas

ing. When the greased pan is placed in the seed pan, the shortening picks up a layer of seed (see photo).

Egg wash on the rolls is more adhesive than shortening, and the seeds are transferred to the rolls by applying the bottom of pan No. 2 to them. Thickness of the seed coating depends on the pressure applied.

Shortening on the pan bottom only needs occasional renewal.—*W. J. Holmes, Miami, Fla.*



Prevents Filling of Partly Waxed Milk Cartons

To prevent partially waxed "drainer" Pure Pak milk cartons from being run through our model F machines we installed a special switch inside the cooling unit at the end of the steam wiper (see sketch).

The switch has three components: A solenoid, a Microswitch attached to the solenoid core, and a T-hinge.

After the machine is stopped for 10 sec. a 12-impulse relay on the recirculator panel energizes the solenoid. It then pushes the normally closed Microswitch against the T-hinge. If cartons are on the steam wiper pan the switch is opened and this breaks the main circuit.

The operator has to remove all drainer cartons from the wiper pan in order to continue normal operations.—*H. Tiller, Quality Control Supervisor, Southern Dairies, Inc., Asheville, N. C.*

USDA Truck Cooling Ideas

Here are two truck shipping tips —one for hogs, and the other for frozen products.

First test results show that shrinkage and death of hogs, in transit, can be curbed by giving them showers. Using metal pipe and plastic lawn soaker hose, a system can be hooked

up that is connected to a water faucet at each truck stop.

Shrinkage of 7-800 lb. in a 22,000 lb. load was cut by a third in the tests, and death loss was cut to zero from 3.3%. Straw was too slippery for bedding when trucks were showered, but sawdust was satisfactory.

A new plastic curtain helps keep temperatures down inside refrigerated trucks, during summer deliveries when doors are open. Problems encountered with previous types have been largely eliminated. These include frosting and remelting on packages, keeping light out, becoming wet and annoying to the driver, and freezing stiff during night chilling.

The 2-panel sheet is made of 0.0075-in. clear polyester film, framed on all edges with 16-oz. Neoprene-coated Nylon to prevent tearing and lend stability. Two pounds of lead shot are put in the hem of each panel. Users say the units keep trucks cooler, give good lighting, are inexpensive, durable, and easily installed (by means of double-eye harness snaps), and don't drip.—*"Agricultural Marketing," publication of USDA.*

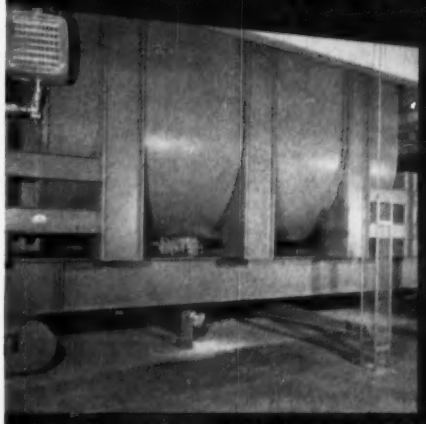
Scrapes Wire Belt Clean

When freezing a product on a woven wire belt running through a frigid air blast tunnel some particles may cling to the belt—especially if the product is too moist.

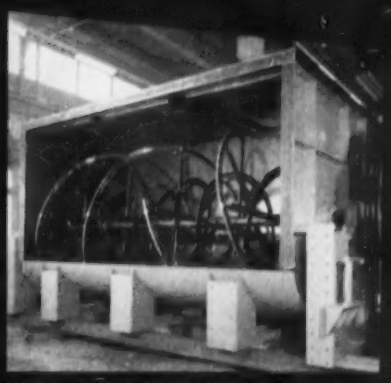
A series of sheet steel scrapers at the discharge end (see photo) will keep the lower run clear, saving product and eliminating messiness. This installation on a frozen lima bean line (by Cambridge Wire Cloth Co.) has the scrapers hinged at the bottom. Contact of the scraping edge with the belt is insured by springs as well as the natural resiliency of the blades.—*FE Staff*

DAY'S largest blender, drive end view. Mixes a carload at a time.

DAY builds world's largest mixer for CLINTON



The world's largest blender built by DAY and installed at Clinton's new plant.



Interior of DAY'S largest blender, showing one of the two 9' agitators.

The world's largest mixer is part of a big installation of DAY equipment recently installed at the Clinton Corn Processing Company, a division of Standard Brands, Inc., Clinton, Iowa. It is so large that it can blend 60,000 lbs. of dextrin (one carload) at one time, assuring absolute uniformity of these huge batches.

DAY mixers, blenders, sifters, roll mills, and laboratory equipment are found in many major process plants, helping produce products better, faster and more profitably. You, too, will improve quality and cut costs when you use DAY process equipment. Write for information.

SERVING THE PROCESS INDUSTRY SINCE 1887

4924 BEECH STREET
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The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.

So much for so little...

SHULTON VANILLIN and VANITROPE*

Vanillin... of the very highest quality, Shulton Vanillin, U.S.P., is controlled throughout its manufacture to rigid flavor standards, and is highly recommended for foods and beverages of superior quality.

Vanitrope*... a proven economy standard, 25 times stronger than vanillin, yet saving you up to 50% in flavor costs, is ideal for enhancing flavor, its rich, sweet aroma being remarkably like that of the freshly-cut, cured vanilla bean.

Vanillin & Vanitrope*... the finest vanilla-type flavor ingredients you can buy, work well together, or alone, and can easily be incorporated into your formulas.

Technical data, samples, and additional information, on request.

*T. M. REG. BRAND OF PROPENYL GUAETHOL.

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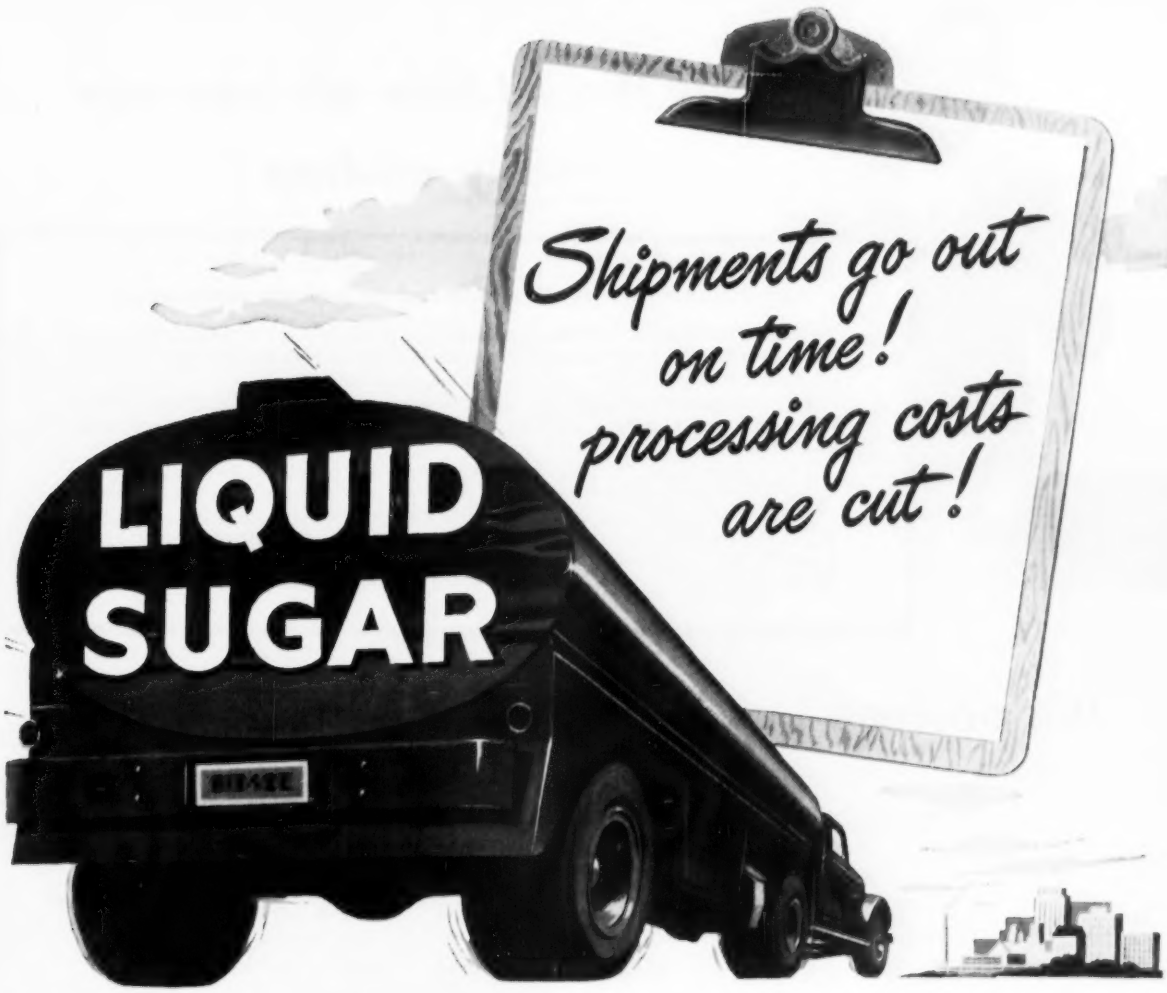

YOU SAVE both time and money when you clarify sugar liquors with Celite* diatomite filter aids. Save time because Celite filtration lets you combine P_2O_5 lime defecation, decolorization and clarification *all* in one operation (and insures you of outstanding color removal and brilliant clarity, too). Save money because you use your existing mixing tanks and filters and reduce decolorizing vegetable carbon consumption. In addition, in bone char refineries, char filter loads are also reduced when Celite filtration is used.

Celite also gives you important advantages over other diatomites. First, its lower wet density provides greater filter surface coverage . . . six bags do the work of seven bags of other diatomites. Second, you get more consistent results because Celite is more uniform. Each bag is mined and processed at the world's largest and purest commercial diatomite deposit . . . and sped to you direct or through J-M's nationwide warehouse network.

JOHNS-MANVILLE JM PRODUCTS

For more information on how Celite filtration can save you time and money and give you better filtration results, call your nearby Celite engineer or write Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

Johns-Manville CELITE
diatomite filter aids

when you filter with CELITE

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

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Is the oil-free air you use really oil-free?

Let us make this sterile cotton test on your air compressors

This Gardner-Denver fieldman is showing you the results of two air discharge tests made on two air compressors—one of them the *new* Gardner-Denver oil-free Model CACB.

The cotton filter on your left, upon removal from the air discharge pipe of the standard compressor, showed discolorations made by oil stains and other impurities.

The cotton filter on your right was removed from the discharge pipe of the new CACB compressor—*entirely free from oil vapor and other foreign matter.*

If you must have pure, oil-free air for instrument controls, food processing, brewing, distilling, or the manufacture of plastics and other products, our fieldmen will come on call to test your compressors for oil contamination. Write Gardner-Denver Company, Quincy, Illinois.

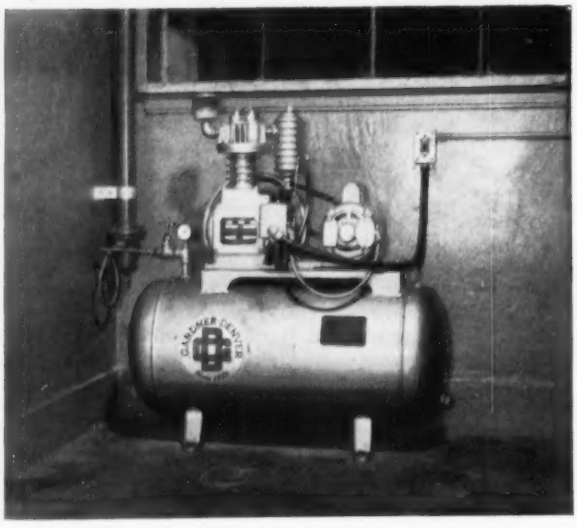
It's oil-free . . . if it's from the *new* CACB!

Another Gardner-Denver "First"—oil-free air from a small compressor

Now, for the first time, oil-free air is available from a small, space-saving compressor—base or tank mounted—for instrument control and other small-capacity uses.

The heart of the new Gardner-Denver CACB oil-free compressor is the carbon parts which require no oil or water lubrication in the cylinder.

The CACB is a single-stage, air-cooled compressor that supplies 4 to 5 cubic feet of oil-free air per minute. It is suitable for discharge pressures of 40 to 100 psi. Automatic start and stop controls are supplied as needed. In addition, it has the same quality construction features of all Gardner-Denver tank-mounted compressors; for example, an alloy crankshaft with self-lubricating main bearings on *both sides* of the throw.



Write for complete details.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

ATLANTA, GA.; BIRMINGHAM, ALA.; KNOXVILLE, TENN.; WASHINGTON, D. C.; NEW YORK, N. Y.; PHILADELPHIA, PA.; PITTSBURGH, PA.; NEW ORLEANS, LA.; LOUISVILLE, KY.

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Keep Fat Out of Your Promotional Fire

"Drastic changes in the amount and type of fats consumed by the general public cannot be justified as a means of reducing the incidence of heart attacks or strokes . . . Existing evidence does not justify a rigid stand on the relationship between what people eat—especially the fat content of the diet—and hardening of the arteries."

We quote the crux of a report by the Nutrition Committee of American Heart Assn. This was released to the press, printed in *Circulation*, official journal of AHA, and condensed in the *Journal of American Medical Assn.*

This means that the food manufacturers have had a timely and defensive public relations act performed for them. At least the medical profession and the heart specialists of the country now know the score.

But a few food manufacturers need to read the report, too. There are scattered instances of attempts to capitalize on scare publicity in respect to fats to promote specific products.

No food company should forget its responsibility to the health of consumers. This responsibility is not served by misleading promotion.

People in our industry should keep themselves apprised of current nutritional knowledge, and of all new information that will come out of extensive research on dietary factors.

In addition to the report mentioned above, you can get facts on fats from American Meat Institute and from National Dairy Council.

Do so before you do anything foolish.

Be Whole Food Man – Not Management Cripple

During the early years of their careers in the food industry, most men earn their pay as specialists in one phase of the business. And it is not surprising that many unwittingly develop into narrow-gage assets to their firms. Not surprising—but most unfortunate, both for the individuals and their employers.

As you progress to a position of responsibility for one area of a company's operations, you must broaden your sights. Why? Because your part of the business cannot be isolated from the others. Each company activity is part of an integrated operation with a single purpose. The aim is to put desirable products into the hands of consumers at competitive prices that provide a profit margin large enough to assure the future of the company—and your future.

This integration can be achieved only if your activities are guided by a keen understanding of how they dovetail with—and support—other phases of the business.

In short, you must take the same broad view of operations that your president takes—the whole view.

Another development coincides with this trend to integrated management. It is a new focus on marketing. The purpose is to lower costs through higher efficiency and productivity. The effect will be to supplement the benefits of continuing modernization of production facilities.

In tune with these trends, FE introduces a broader editorial formula in this issue. This formula is aimed at the whole food man—and those who must become whole men rather than management cripples.

GALLUP SURVEY REVEALS FOR ANISE FLAVORING IN

Are You Overlooking Profitable Markets as Shown in This Nationwide Survey.....▸

There are many appetizing flavors on the market today, but here's one that appeals strongly to one out of every three adults in the U. S.

It's anise—made in this country under the name of anethole.

Anise, or the closely similar licorice taste, has a strong army of supporters—as shown by a recent Gallup Survey—to merit its use in many products where a variety of flavors is now offered.

Perhaps one reason why anise, in recent years, has been overlooked is the unreliability of supply of oil of anise from Red China.

Today, American-made anethole is available in full commercial quantities, meeting U.S.P. specifications. Manufactured under rigid quality controls, and from a plentiful domestic raw material source, anethole opens the way for you to include anise-flavored products in your line without worries over fluctuations in supply.

Ask your regular supplier for Hercules® anethole or flavors based on anethole.

HERCULES POWDER COMPANY
INCORPORATED
Wilmington 99, Delaware

IN HARD CANDIES

IN CHEWING GUM

IN CAKES & COOKIES

This survey was conducted in March, 1957 by Audience Research, Inc. as part of its National Opinion Trends reports and is reproduced by permission of the Gallup Organization, Princeton, N. J. A total of 1,627 personal interviews, consistent with the distribution of the adult population, were conducted by trained Gallup Poll interviewers. Since "anethole" and "anise" are both terms unfamiliar to the majority of the American public, the flavor was first described as "licorice." When

HERCULES ANETHOLE

← For more data, circle this page number on card at back

SUBSTANTIAL PUBLIC VOTE FOODS AND CONFECTIONS

44% WOULD LIKE

31% WOULD LIKE

30% WOULD LIKE

specific preferences in cakes, candy, and gum were asked, the respondent was told "there is a flavor called anise which resembles licorice . . . suppose the following products were made with a mild licorice flavor or anise taste?" Since it is recognized in the chemical industry that anethole, U.S.P., is equivalent to imported anise, and has been used for years, the findings of this survey on anise flavor preferences can readily be applied to anethole.

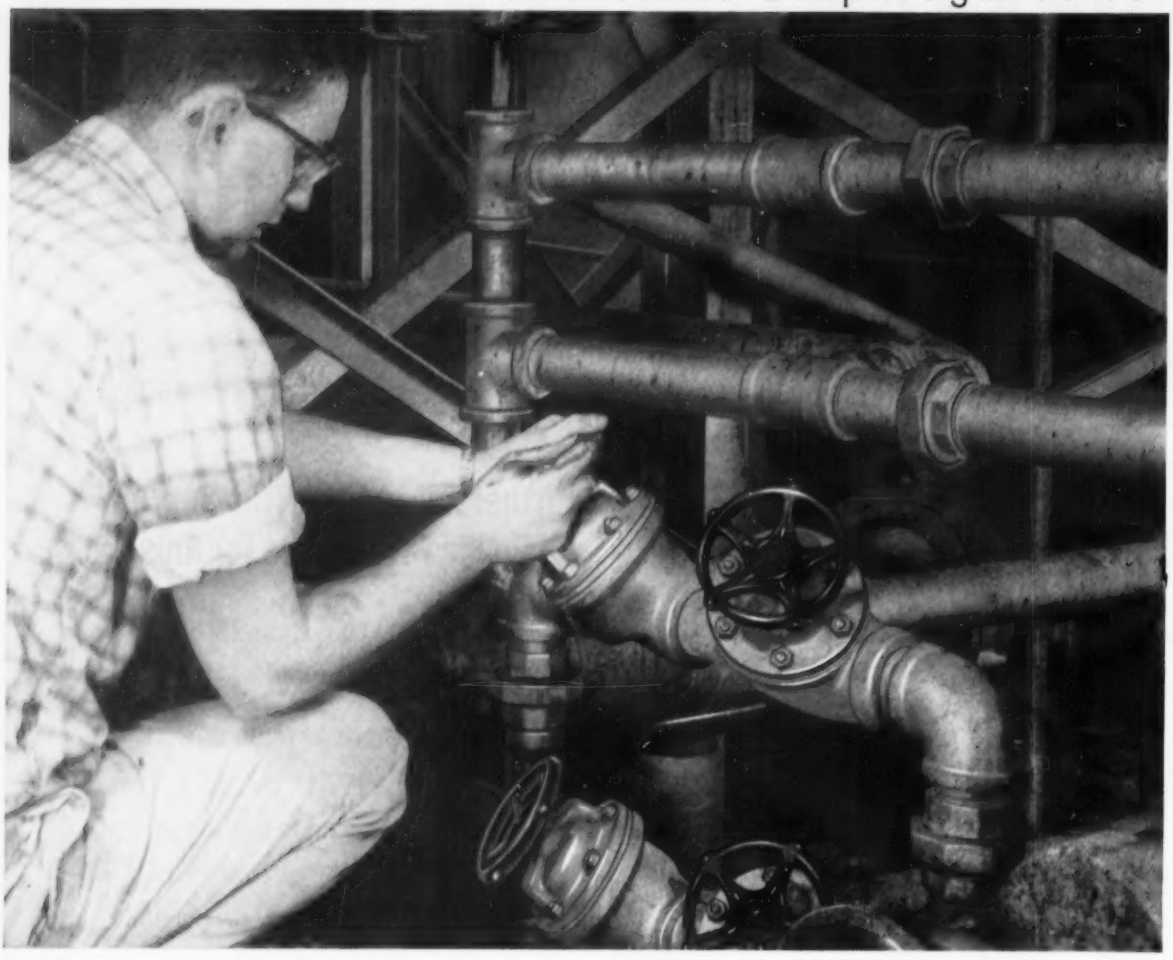
Further Facts from This Survey on Public Preference for Anise

- Nearly 34,000,000 adults (based on the estimated U. S. adult population of 103 million) are real fanciers. Also, another 16,500,000 adults like the flavor.
- A larger proportion is in the upper economic group.
- There is a slightly larger proportion of women than men fanciers.
- More younger adults than older persons say the anise flavor would appeal to them.
- Strongest regional areas of preference are the East and the West, and in communities of over 500,000 population.
- Those that like the flavor are strongly in favor of it!

NC57-1

HERCULES **ANETHOLE**

Another satisfied user of Crane Diaphragm valves



Best by test for this heavy, sticky emulsion —Crane diaphragm valves

What valve is best and lasts longest in this service? A West Coast emulsified asphalt producer tried them all on the manifold above and here's what was found.

Conventional valves would become inoperative in a short time. The main trouble was binding of the stem in contact with the cold, heavy asphalt emulsion.

Ordinary diaphragm valves on the same service lasted only two months and had to be replaced. The diaphragms didn't stand up and the high torque required for closure was impractical for frequent operation.

Three years ago the plant started using Crane No. 1610 Packless Diaphragm Valves. The neoprene diaphragm functions only to seal the bonnet. It is not subject to crushing and excessive wear as a seating member. The separate disc in combination with Crane Y-pattern body makes positive closure with minimum torque and turns. These valves are giving full satisfaction.

Literature on Request

Wide choice of body and diaphragm materials makes these exclusive Crane valves particularly useful to process industries. Ask your Crane Representative for Circular AD-1942, or write to address below.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

FOOD ENGINEERING

". . . It is necessary to erase arbitrary lines of department responsibility. Effective performance demands that all functions be blended into one inter-related operation.

". . . Competition is so severe that selling prices cannot be raised to compensate entirely for higher costs. Management believes the answer is to further step up productivity of the marketing operation, as it has increased the output of production facilities.

". . . This may be the greatest challenge grocery manufacturers have yet been called upon to meet."

Paul Willis

Trends Challenge Management

- **Must blend all functions into efficient food company operation.**
- **Offset rising costs by focusing attention on marketing productivity**

PAUL S. WILLIS
President, Grocery Manufacturers of America, New York

With grocery manufacturers seeking ways and means to offset the effect of steadily rising costs, "coordination" has become one of the major subjects of discussion in top management circles. The objective is to harness all technical, mechanical, and creative departments for contribution to the company's overall operational efficiency.

Management realizes that such diverse activities as research, technology, traffic, advertising, and selling, all form a single "big picture." Each has a bearing on the others, and all play a part in the success of the business. It is necesary, therefore, to erase any arbitrary lines where one department's responsibility supposedly ends. Effective performance demands that all functions be blended into one inter-related operation.

The food technologist and the sales manager work under different conditions and face different problems, but they share a common desire—to have a salable product. Each has information and ideas that can be helpful to the other. With open lines of communication and coordination by management, they can both do more good for the company.

Similarly, the merchandising director should be in close touch with the traffic manager. There are instances when considerable money can be saved as a result of working with the transportation department prior to scheduling a brand promotion.

The present emphasis on coordination is one part of management's reaction to the pressure on profits. Despite a generally high volume of sales, recent statements of most grocery manufacturers show a sharp earnings decline. Wage rates, transportation rates, and taxes are continuing to climb. Competition often does not permit the full addition of these higher costs to selling prices. (turn page)

"... mesh marketing operation with work of other departments."

For most of the last 15 years, management has concentrated on production. Capital investment per production worker has grown from $8,500 in 1946 to about $17,000 today, as plants were modernized and expanded. The resulting increases in machine productivity enabled manufacturers to absorb a large part of the cost rises they faced every year.

Production cannot be increased at the same fast rate as before. But costs are still going up. So management must search elsewhere for economies.

Executives therefore are focusing special attention on the marketing side of the business. They hope to get greater productivity out of advertising and selling dollars. They look to cost savings through greater efficiency in handling and distribution of the merchandise.

During the years when top management was primarily concerned with raising production, it is possible that certain marketing policies may have been adopted which did not bring maximum results in terms of profitability. If any of these practices remain, they will be swiftly corrected in the course of the present exhaustive investigation.

New Thinking Needed, Too

But the current search is not entirely devoted to uncovering possible inefficiencies. The major purpose is constructive—to build a more streamlined marketing organization, one in which advertising, distribution and selling will be tightly synchronized. In addition, management is striving to mesh the marketing operation as closely as possible with the work of other departments.

Company presidents are asking such questions as:

- "How can we get our advertising dollar to sell more goods?"
- "How can we get our salesmen to spend their time more productively?"
- "How can we improve our distribution techniques to provide better transportation service at lower cost?

Better coordination of departments within a company can sometimes produce the desired effect. For example, one large grocery products manufacturer recently developed a new pricing plan. It was designed to increase sales by giving customers the full benefit of transportation savings resulting from quantity orders.

Obviously, formulation of this plan called for the closest kind of coordination between the sales and traffic departments. The mathematical computations that had to be made were vast. But in the end, the manufacturer succeeded in modernizing his distribution policies and pricing his product attractively to his customers. As a result, the sales force is able to enjoy a stronger competitive position because management used the traffic department in a creative and coordinated way.

This concept of bringing transportation people into marketing discussions is one of today's significant developments.

In these days of vigorous competition, manufacturers of branded products must do their utmost to improve customer services. The transportation field offers many opportunities for strengthening a brand's position in the eyes of distributors.

The drive for better coordination is not confined just to the various departments in the home office. The advertising agency, for example, almost must become more intimately connected with the company than has sometimes been the case in the past.

Seek Maximum Advertising Results

Advertising is one of the largest, and sometimes the largest, single item in the corporate budget of grocery manufacturers.

No wonder that management wants to make sure of the maximum sales results for every advertising dollar invested. Such results are much more likely if the agency performs worthwhile marketing services, in addition to creating and placing advertisements.

Agencies must be prepared to help a grocery manufacturer in competitive selling situations within the trade. That means they must be brought into the "family" and become a full fledged member of the coordinated marketing operation. Then they should be expected to make constructive recommendations on such subjects as product improvement, package redesigning, label changes, price adjustments, and merchandising plans. In this way, agencies will really earn their commissions and the manufacturer's advertising dollar will be more productive.

Making the advertising dollar sell more goods also requires constant attention to the sales power of the advertisements themselves. Executives realize that circulation and ratings alone are no longer a good measure of the sales effectiveness of an advertising program. In these times of rapid population shifts and changing social and economic conditions, individual media and individual advertisements need to be carefully watched to see that the greatest number of the best prospects are reached in the most effective manner.

Function of Salesman Changing

Another place where management is seeking greater productivity is the sales force. With so much pre-selling as is done today, and with more and more distributors ordering merchandise according to the dictates of IBM machines, the function of the salesman is no longer just to pick up an order. In fact, many distributors prefer to mail in their orders.

Nowadays a salesman must be trained and qualified to offer helpful marketing ideas to his customers. He must be able to demonstrate how the store can make greater profits as a result of featuring his product. Salesmen who can do this will be welcomed by the distributors, and will thus be able to use their time productively. By contrast, the time a salesman spends in waiting rooms, because distributors don't feel that they can benefit from seeing him, is quite unproductive.

Knowing this, management is taking steps to make sure that sales selection and training programs are geared to produce a growing stream of merchandising men.

Face Brand Franchise Problem

Another major concern of grocery manufacturers today is to build and maintain a powerful brand franchise. Everything a company does to move its product has a bearing on the brand's standing. This includes the way

salesmen sell it, the way traffic people ship it, and the way advertising and merchandising executives promote it.

It is the responsibility of top management to establish policies designed to strengthen the brand franchise. Just as important is the matter of seeing that these policies are carried out effectively by all departments and personnel.

This calls for efficient communications. Everyone must *know and understand* exactly what action he is expected to take in working toward successful achievement of the company's objectives.

On paper this seems simple. However, in practice it sometimes happens that the policy which has been laid down in the home office goes astray "somewhere along the line" before it reaches the field men.

For example, it is the policy of manufacturers to give distributors advance information on forthcoming promotions, so that arrangements can be made to tie-in. Occasionally there are situations where the manufacturer believes that the information has been made available, but where distributors say that they did not receive it. The blame can be traced to faulty communications.

Management is aware that smooth communications are vitally important, not only to facilitate selling efforts, but also to achieve the complete coordination of all operations. This is a subject which is being given constant attention on high executive levels.

The food industry has faced many hard challenges in the past and, in meeting them, has built up an unparalleled record of efficient, low-cost service to the American people. In the war and postwar period, when all-out production was needed, it constructed immense facilities to meet the requirements of the time.

For many of these years, it was easier to get an order than to fill it. Now the situation is reversed. There is abundant output, and the problem is to dispose of it profitably. The cost of obtaining and delivering orders is rising steadily.

Grocery manufacturers are allocating more than a billion dollars a year for advertising alone. Salesmen's compensation is going up. Transportation rates are advancing. The price manufacturers must pay for all the goods and services involved in marketing are climbing continuously.

However, competition is so severe that selling prices cannot be raised to compensate entirely for higher costs.

What is the answer to this squeeze? Management believes that the answer is to further step up productivity of the marketing operation, just as it has vastly increased the output of its production facilities.

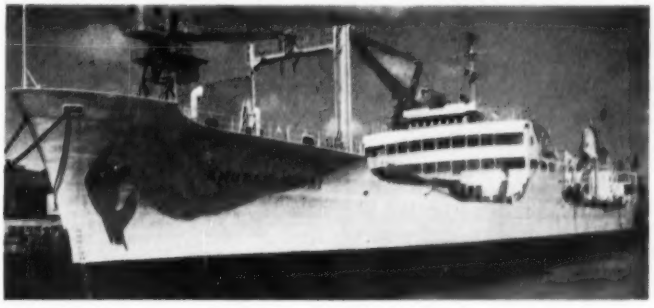
With the food industry's marketing system already considered a model of efficiency, this may be the greatest challenge the grocery manufacturers have yet been called upon to meet.

Comments from readers on today's challenges to management—and what can be done to meet them—will be appreciated.—The Editors.

Wine Tanker—

RR's New Competitor

Ocean-going ship will carry 17 million gal./yr. in strong bid for lower-cost transportation . . . Return cargo a factor



FIRST U.S. wine tankship is California vintner's answer to rising cross-country freight rates.

LATEST CHALLENGE to rising cross-country freight rates is this giant wine tanker, first U.S. ship to haul bulk California wines to the East Coast.

Built for United Vintners, Inc., San Francisco, the $7 million vessel has completed the first of seven annual trips from Stockton, Calif., to Houston, Tex., and Newark, N. J. Its 26 stainless-steel wine tanks carry a payload of 2.4 million gal., or nearly 17 million gal. a year. In addition, side ballast tanks can haul 1.5 million gal. of non-food items.

Negotiations are under way to line up suitable return-trip cargoes (such as liquid sugars, beverage alcohol, and edible oils) vital for economy.

If successful, the venture portends far wider food-industry use of water shipment for bulk liquids.

Meanwhile, just this advent of water-haul competition has affected the wine-marketing picture. Citing United Vintners' potential competitive advantage, other processors have forced the railroads to cut freight rates on wine. And further reductions are seen in the near future.

FOUR flexible hoses load 2.4 million gal. cargo in 9 hr. at Stockton, Calif.

Licking Problems the

Stumped by a baffler? Such as, "Which dealer should I supply from which plant?" If so, try the electronic computer method of speeding the answer. Here's the A-B-C of doing it—on your own form sheets

CHARLES E. FRENCH and MILTON M. SNODGRASS

Respectively, Professor and Assistant Professor, Agricultural Economics Department, Purdue University, Lafayette, Ind.

MANY TOUGH plant "posers" are now being answered by electronic "brains" using a new method called the "transportation problem of linear programming."

We'll show you here how to set up your questions of this type so that they can be easily solved. In truth, this method is simple enough so that you can carry it out without an electronic "brain" at all.[1]

We must admit at the start that this gets a little involved, as already implied in the first two articles of this series.[2, 3] You may work through a problem and the idea may intrigue you—and yet you may find you aren't quite sure of yourself.

In that event, call in a representative of one of the "brain" makers, or someone in one of the colleges or consulting companies who's had experience with the electronic computers. It's a new idea, and a little help may go a long way.

Down to Points

Suppose you're a food processor making several products from a basic raw material and shipping these products to various destinations with various demands. Naturally, you want to minimize shipping costs and maximize consumer satisfaction. So what method of shipping should you use? And which dealers should you supply from which production plant?

Or take another problem: What is the least-cost method of handling your materials (raw materials to processed product) as they flow through machines of various capacities and production rates within your plant?

These are just two examples of problems tailor-made for the "transportation problem of linear programming."

What Is It?

The "transportation problem" in its basic essentials, is an efficient mathematical tool for planning. In this manner it is much like the "general problem" we discussed last month.[3] Although the transportation model is not as flexible, it is much less time-consuming and much easier to solve.

This technique—sometimes referred to as the "Distribution" or "MODI" (Modified Distribution) method—is of greater assistance than the "general problem" in day-to-day planning. Whenever you can frame your problems within the restrictions of the "transportation problem", you will get quicker answers at lower cost.

What are these restrictions? Well, we may note that mathematicians say this about the problem:[4]

1. One unit of *any* input can be used to produce one unit of *any* output.

2. Cost or margin which will result from conversion of one unit of a particular input into one unit of a particular output can be expressed by a single figure, regardless of the number of units converted.

3. Quantity of each individual input and output is fixed in advance, and the total of the inputs equals the total of the outputs.

Now, what problems can meet these restrictions? Here, it is already obvious that the majority of ordinary transportation problems meets these restrictions with little or no modification.

Let's say that you make a processed food in several plant locations and move it to several warehouses. Of course, you wish to transport it at least total cost. Probably each plant has a different production capacity and each warehouse needs a different amount of product.

This problem is not hard for 2 plants and 3 warehouses. But can you do it with 15 plants and 20 warehouses?

Let's look at a somewhat difficult problem: Suppose you make six products using four machines. If your plant operates only one shift, there is a limit of 40 hr. available for each of the four machines. Two of the machines are new and two are relatively old, which means that their efficiency differs in production per hour. Also, some products take more machine time than others. Thus, costs of manufacturing differ. And those of selling also differ.

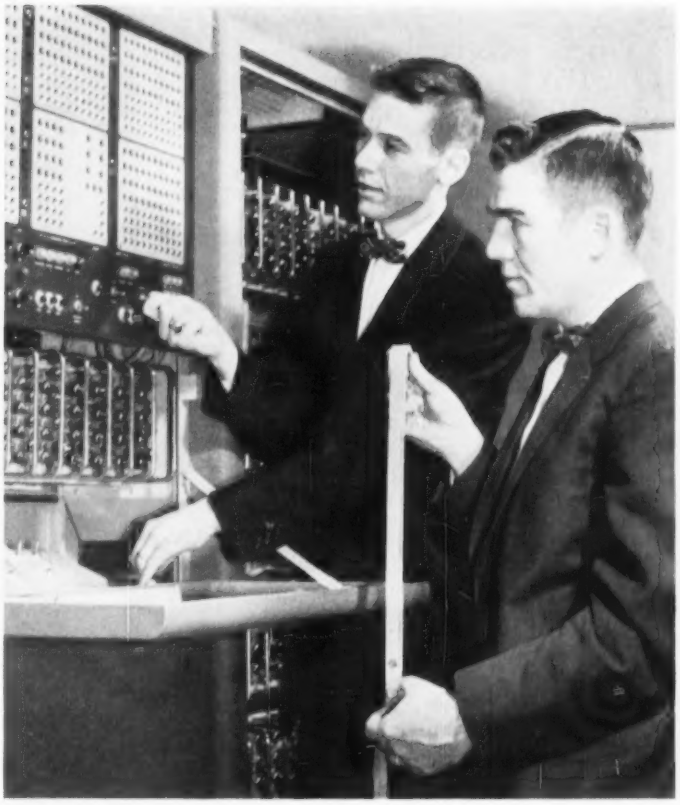
With a given amount of product orders (demand), how can you minimize cost and/or maximize profit in scheduling orders through the various machines?

This one fits the restrictions. We won't solve it now. You might come back to it after you finish this article and see if you can set it up.

"Do I Need a 'Brain'?"

Whether you require an electronic "brain" depends on how "big" your problem is and what "shape" it represents. If you are shipping from 20 supply or source points to 20 destinations points, you are coming close to needing a machine.

'Brain' Way



'BRAIN'S' LIGHTNING SOLUTION of complex food problems is initiated "at the flick of a switch." Data is fed in by punch tape, such as held here by Author French. At console is Co-Author Snodgrass.

This problem's size would be called 20 x 20 and its shape would be square. However, you might supply 50 warehouses from only 5 factories—your problem then being 50 x 5 and its shape long and narrow. This latter problem is somewhat easier (even though it looks harder), and you could probably easily do it by hand. It would be "duck soup" for the "brain."

The only mathematics required here is simple arithmetic. Any good clerk could easily be taught how to do it. In fact, it is enough fun so that some people have even used it as a party game.

The harder part is gathering the appropriate data and putting the problem into the proper form for solving. Whether you need a "brain" will depend entirely upon the amount of arithmetic involved.

Putting the Problem in Shape

First, let's see how to solve a very simple transportation problem: Say you have three factories (F_1, F_2, F_3). And you ship a given product to 4 warehouses (W_1, W_2, W_3, W_4).

Needed are three pieces of information: Production at each factory, amount demanded at each warehouse, and cost of transporting a unit between each factory and each warehouse.

With this data you can easily solve the problem of how to minimize total costs while still getting the job done to everyone's satisfaction. Your data would look like this:

Production	Needs
Factory F_1 = 100	Warehouse W_1 = 60
Factory F_2 = 200	Warehouse W_2 = 120
Factory F_3 = 70	Warehouse W_3 = 90
	Warehouse W_4 = 100

Then we have cost of transportation in dollars per unit:

From Factories	To Warehouses			
	W_1	W_2	W_3	W_4
F_1	3	5	4	8
F_2	3	6	1	7
F_3	6	2	5	3

Actually, this problem is nearly ready for the "brain" right now. For most "brain" companies could take it in this form and hand you back your answers.

To make sure we understand it, and as a check on errors, let's put it mathematically. We only need to recall a little of our algebra. We can use a little math jargon to simplify things.

Let F_1W_1 stand for the number of units we should ship from factory F_1 to warehouse W_1. Likewise, F_1W_2 stands for amount shipped from F_1 to W_2; F_2W_1, amount shipped from F_2 to W_1; etc.

Getting it in math terms is now easy. Moreover, the "brain" people will like it better. Also, you yourself will probably understand it better in the process. For example, we can get rid of all of factory F_1's output with this equation:

$$F_1W_1 + F_1W_2 + F_1W_3 + F_1W_4 = 100$$

And these two take care of the output of the other two factories:

$$F_2W_1 + F_2W_2 + F_2W_3 + F_2W_4 = 200$$
$$F_3W_1 + F_3W_2 + F_3W_3 + F_3W_4 = 70$$

Then, we can satisfy warehouse W_1's needs with this equation:

$$F_1W_1 + F_2W_1 + F_3W_1 = 60$$

These three take care of the needs of the other warehouses:

$$F_1W_2 + F_2W_2 + F_3W_2 = 120$$
$$F_1W_3 + F_2W_3 + F_3W_3 = 90$$
$$F_1W_4 + F_2W_4 + F_3W_4 = 100$$

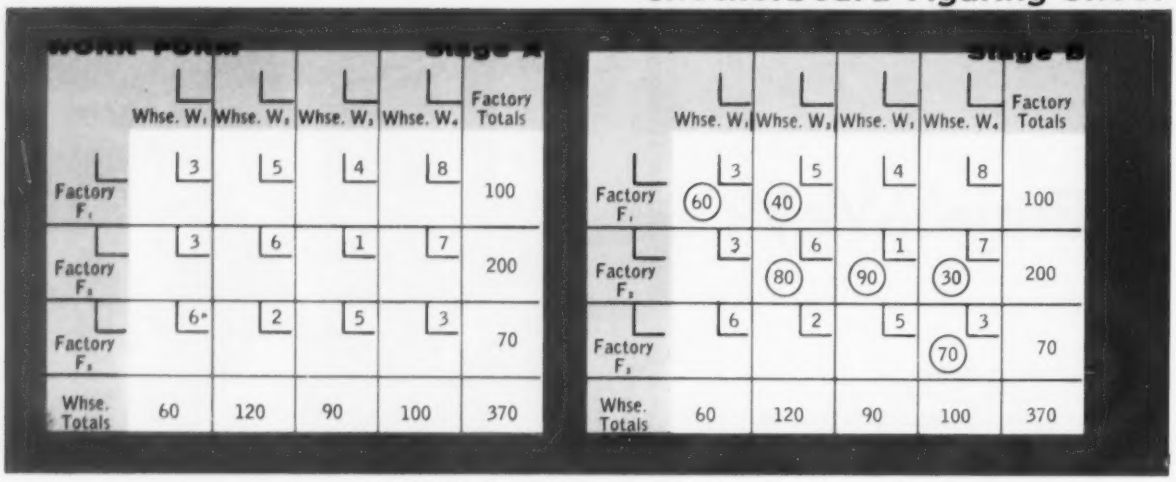
We require only one more equation to have the whole thing ready for the "brain"—that is, this one giving us the minimum cost:

$$\$3F_1W_1 + \$5F_1W_2 + \$4F_1W_3 + \$8F_1W_4 + \$3F_2W_1 + \$6F_2W_2 + \$1F_2W_3 + \$7F_2W_4 + \$6F_3W_1 + \$2F_3W_2 + \$5F_3W_3 + \$3F_3W_4 = \text{Minimum}$$

That's the whole story in math. And if you can frame your problem this way, you are ready to give it to the "brain."

Yet, it's really simple to do this

Checkerboard Figuring Sheet



WORK FORM — Stage A	Whse. W_1	Whse. W_2	Whse. W_3	Whse. W_4	Factory Totals
Factory F_1	3	5	4	8	100
Factory F_2	3	6	1	7	200
Factory F_3	6*	2	5	3	70
Whse. Totals	60	120	90	100	370

Stage B	Whse. W_1	Whse. W_2	Whse. W_3	Whse. W_4	Factory Totals
Factory F_1	3 (60)	5 (40)	4	8	100
Factory F_2	3	6 (80)	1 (90)	7 (30)	200
Factory F_3	6	2	5	3 (70)	70
Whse. Totals	60	120	90	100	370

WITH THIS JOTTING FORM you're set to work out a money-saving product-distribution scheme. Given are factory outputs (last column), warehouse demands (bottom row), and transport costs (in small squares in boxes of body of form). Stages of progressive figuring are explained in text.

one on your own desk—as we will now explain.

How to Solve It Yourself

Since it's important here to be extremely systematic, start by sketching out your problem on a work form (see illustrations). This form has room for all the different types of data you have available, plus room for some items you must calculate.

Look at the figures in the last column. These are the outputs of each factory, with the total for all factories at the bottom. Look also at the bottom row. Figures here are the needs of each warehouse. They total across to 370—the same as the output of all the factories.

Now observe the boxes of our form. You'll see that those representing the factories (left column) and the warehouses (top row) have no entries as yet in their small squares at the upper right of each one. However, the small squares in the boxes of the body of the form do have figures. These are the transportation costs.

For example, note the box to the right of Factory F_1 and below Warehouse W_1. Here, the small square contains the number 3. Recall we said it cost \$3 per unit to ship from F_1 to W_1. The others have similar meaning (our given data).

Now, we will work through these data with a systematic step-by-step procedure to *the one best answer.*

Step I. Add the number of factories and warehouses together (3 + 4 = 7) and subtract 1 (answer 6). This is the maximum number of shipments of product necessary to get the lowest cost solution.

Step II. The idea in this step is to get a basic solution that will satisfy every factory and warehouse. But it may not necessarily be the lowest-cost one. This is merely our first approximation of the best answer. To formulate such a first approximation we must make 6 shipments, because 6 was the number resulting from Step I.

The circled numbers in Stage B of our Work Form show one way. We can begin by assigning shipments, filling demand requirements from available production.

We will start in the upper left box (which we may call F_1W_1). W_1 requires 60 units and there are 100 available from F_1. Thus a "60" goes in this box, representing a shipment of 60 units, and leaving 40 to be shipped to W_2. The latter warehouse still needs 80 units, which it can get from F_2, as noted. And F_2 can also supply W_3 with its requirement of 90. This leaves 30 units of production from F_2 to be shipped to W_4. And the remaining requirement of 70 at W_4 can be supplied by F_3.

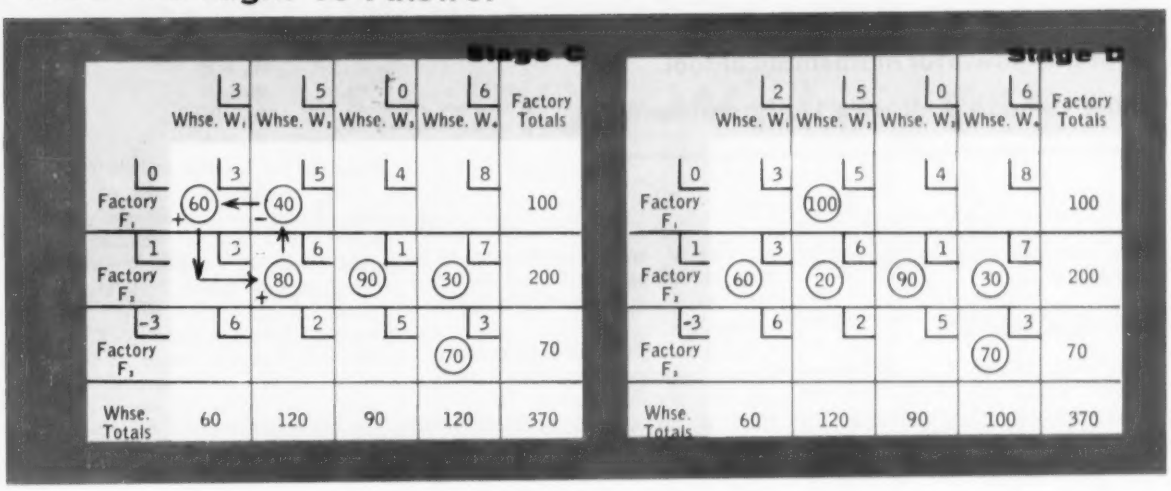
This is one solution to the problem. However, its cost is probably greater than it needs to be. To find out the cost, you merely multiply the amount of shipment in each box by the transportation rate in its upper right square, and then total all of them. Since there are 6 shipments in this case, the cost is:

$$(60 \times \$3) + (40 \times \$5) + (80 + \$6) + (90 \times \$1) + (30 \times \$7) + (70 \times \$3) = \$1{,}370$$

Step III. Next, we calculate the values to be inserted in the small squares contained in the factory and warehouse boxes (see Stage C of Work Form). There must be one for each. First, the value for the square of F_1 is arbitrarily picked as zero. We could assign any other value, but zero makes computations easier. The rule we follow to find the factory-square values and the warehouse square-values is this:

Let us call the circled shipments, "stepping stones." For any square *which has* a "stepping stone," the value in the small square in a factory box, plus the value in the small square in a warehouse box must

Takes You Right to Answer


Stage C
Whse. W₁ 3
Whse. W₂ 5
Whse. W₃ 0
Whse. W₄ 6
Factory Totals
Factory F₁ 0 3 5 4 8 100
60 40
Factory F₂ 1 3 6 1 7 200
80 90 30
Factory F₃ -3 6 2 5 3 70
70
Whse. Totals 60 120 90 120 370
Stage D
Whse. W₁ 2
Whse. W₂ 5
Whse. W₃ 0
Whse. W₄ 6
Factory Totals
Factory F₁ 0 3 5 4 8 100
100
Factory F₂ 1 3 6 1 7 200
60 20 90 30
Factory F₃ -3 6 2 5 3 70
70
Whse. Totals 60 120 90 100 370

equal the transportation value in the square of the box opposite the factory box and under the warehouse box.

Example Clarifies It

That sounds rough. But let us clear it up with an illustration: We assigned zero to the F_1 square. Now, can we calculate the value in the square of the W_1 box? Of course. Zero plus some number must equal 3 (the transportation value in the square opposite F_1 and under W_1). Thus, the only possible number to put in the square in W_1 is 3. Simple!

Continuing on, we can compute W_2 in the same way, that is $0 + W_2 = 5$ so the answer for W_2 is 5. Now we must figure F_2 (we cannot do W_4 yet, because there is no "stepping stone" in Box F_1W_3). F_2 must equal 1 because $F_2 + W_2$ must equal 6 and we already know that W_2 equals 5. The rest of the calculations, in proper order, are:

$W_3 = 0$ because $F_2\ (1) + W_3$ must equal 1
$W_4 = 6$ because $F_2\ (1) + W_4$ must equal 7, and
$F_3 = -3$ because $W_4\ (6) + F_3$ must equal 3.

Form Tip

A word of caution: These values are recalculated with each new approximation. You may want to make the small factory and warehouse squares large enough to change these numbers as you figure things anew.

Step IV. The next part of the solution involves manipulating the 6 shipments in the first approximation in order to cut cost.

Recall that we calculated the values for the squares in the factory and warehouse boxes by using only the transportation costs in the six boxes with "stepping stones." Now to the remaining six boxes:

For each of these *without* a "stepping stone" in the first approximation, we add the appropriate factory value (in square) to the appropriate warehouse value (in square) to see if the sum is "less than", "equal to", or "greater than" the transportation cost in the box under consideration. In doing this, we find (again Stage C of Work Form) the following—

Box			
F_1W_3	$0+0=$	0	This is *less than* the transportation value, 4.
F_1W_4	$0+6=$	6	This is *less than* the transportation value, 8.
F_2W_1	$1+3=$	4	This is *greater than* the transportation value, 3.
F_3W_1	$-3+3=$	0	This is *less than* the transportation value, 6.
F_2W_2	$-3+5=$	2	This is *equal to* the transportation value, 2.
F_3W_2	$-3+0=$	−3	This is *less than* the transportation value, 5.

Now, if all the answers were "*equal to*" or "*less than*", our first approximation would have been the least costly method of shipping our product. However, for box F_3W_1 the answer was "*greater than*"; thus, an additional saving in cost can be made.

Step V. To reduce the cost, or to make the second approximation, pick a box that has no "stepping-stone" in which the factory value plus warehouse value is greater than the transportation cost. If more than one is a "greater than", you will generally cut cost the most by selecting the one that gives the greatest difference in the total transportation cost.

In this case, there is only one such box—F_3W_1. The cost can be reduced if we load F_3W_1 with a shipment. To find the amount of such shipment, we go through the following steps:

Visualize yourself trying to walk across a pond full of "stepping stones." Starting with box F_3W_1—move horizontally to the first box having a "stepping stone" from which you can subsequently move up or down to the next box with a "stepping stone." In this latter vertical move, be sure you go to a "stepping stone" box from which you can again move left or right. Proceed in this way, first moving "east or west" and then "north or south" until you *return to the*

"There are plenty of savings being made with this powerful mathematical tool. So think through your own likely problems."

box from which you started out in the beginning.

Movements Detailed

In this present case, our movements would be: F_2W_1 east to F_2W_2; north to F_1W_2; west to F_1W_1; and south back to F_2W_1. Now you see why we call them "stepping stones."

Next, go through this path once again and assign alternate plus and minus signs to the "stepping stones" in the path (see arrows and signs in Stage C of Work Form). In other words, F_2W_2 is +, F_1W_2 is −, and F_1W_1 is +.

This "tracking" is a standard maneuver in linear programming. There will always be only one possible "track" available to you in moving through the table.

Having assigned plus and minus values, pick out the smallest plus "stepping stone" in the "track" and move this amount over to the box under consideration—F_2W_1. Here, the smallest plus amount is in F_1W_1—that is, 60. This amount is inserted in F_2W_1 and box F_1W_1 is now eliminated as a "stepping stone", having become empty. The other cells in the "track" are adjusted as follows:

For all "stepping stones" assigned pluses, the amount moved (60) must be subtracted. Thus, the amount in F_2W_2 is now 20 instead of 80.

And for all "stepping stones" assigned minuses, the amount moved (60) must be added. Thus the amount in F_1W_1 is now 100 instead of 40 (see Stage D of Work Form).

Have we cut the cost? You can be sure we have! To find how much, merely figure the new cost of this approximation, just as we did in the first approximation. That is—

(100 x $5) + (60 x $3) + (20 x $6) + (90 x $1) + (30 x $7) + (70 x $3)=$1,310.

"Repeats" Tell the Story

Thus, we reduced it $60. But can we reduce it still more?

To see how long we can continue to reduce it, we repeat Steps III, IV, and V until the answers in Step IV all become "equal to" or "less than" the appropriate transportation costs.

So at this point we note that our second approximation was actually the best possible answer. In short, there is no way to get this job done for less than $1,310. And if you want to check yourself on Step IV this last time through, you should have these answers:

Box

F_1W_1	0+2=	2	*less than* 3.
F_1W_2	0+0=	0	*less than* 4.
F_1W_4	0+6=	6	*less than* 8.
F_2W_1	−3+2=−1		*less than* 6.
F_2W_2	−3+5=	2	*equal to* 2.
F_2W_3	−3+0=−3		*less than* 5.

Answer: $1,310

Meaning of the final factory-square and warehouse-square values is pertinent, these values were computed in Step IV for the least-cost solution, and are entered in our Stage D of the Work Form.

First, look at the warehouse-square values. Let's rank them in ascending order as follows:

$$W_3 = 0$$
$$W_1 = 2$$
$$W_2 = 5$$
$$W_4 = 6$$

Now we can see the relative cost or saving in shifting a unit of demand from one warehouse to another. If a unit of demand is shifted from W_2 to W_3, a saving in total transportation cost of $5 is made. A shift from W_4 to W_3 saves $6, whereas a shift from W_3 to W_4 would cost $6 more. A shift from W_2 to W_1, would save $3, but a shift from W_2 to W_4 would cost another dollar.

Let's do the same thing with the factory-square values:

$$F_3 = -3$$
$$F_1 = 0$$
$$F_2 = 1$$

Here, a shift of one unit of production from Factory 3 to F_2 would cost $4, while an opposite shift would save $4. A shift from F_1 to F_2 would save a dollar, while a shift from F_1 to F_3 would cost $3. Thus, it goes.

If, after ranking the factory- and warehouse-square values in ascending order, you shift from one above to one below, you will incur greater cost. But an opposite shift can save money on total transport bill.

So—think through your various plant and distribution problems. You have plenty that will fit this type. Teach someone the method, or set your problems up for an electronic "brain."

There are plenty of savings being made with this powerful new tool the mathematicians have given us. Your company might well add some of these savings to its profit ledger.

"Put me through to Department 16—I have a *staff modification* in mind!"

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4. Alexander Henderson and Robert Schlaifer, "Mathematical Programming—Better Information for Better Decision Making," *Harvard Business Review*, May-June 1954, p. 98.

Now being shaped up is a special do-it-yourself article for the plant man directly concerned with these complex problems. Watch for it in an early FE.

Get the Most 'Calories' From Your Working $$$

It's likely that a lot more performance can be tapped out of your funds and your credit. So says this expert, who then gives you a sharp look at the financing of modern machines and methods

FIRST OF TWO TIMELY MONEY-MANAGING ARTICLES

DAVID L. SALINGER

Director, Industrial Division, Walter E. Heller Co., national business-financing firm, with headquarters in Chicago

A BALANCED financial diet, and proper digestion of it, may be called sound money-metabolism. In fact, it's the basic problem for many food manufacturers today—especially the small and middle-sized producers.

This need to get "high-caloric" energy from funds, particularly working capital, is by no means confined to the food industry. It is a major reflection of three pressing questions: (1) Costs, especially labor costs; (2) competition, generated mainly by expensive but highly productive machinery and methods; and (3) need for continuity and consistency of management.

In the latter term we can include diversification of top management, and its research and development undertakings.

Let us look over this problem of "digestion" from the standpoint of "typical" or average food manufacturers. The question is really two-fold:

First: How can we modernize our machinery and methods in order to keep prices competitive?

Second: How can we set up a broad, long-range program to assure uninterrupted utilization of our facilities—rather than merely extemporizing with year-to-year or day-to-day decisions?

What Is Best for You?

The surest way of getting good use out of every dollar invested in modernization of your facilities is, of course, to choose the right equipment in the first place. And that choice needs to be followed up by a sound maintenance policy, and eventually replacement.

In between your original purchase and your final disposition of the equipment comes your choice (as a manager) of those financing methods that are available to you under today's somewhat peculiar economic conditions.

And to find out how to choose the methods best for you, you have to really know your own operation. This is necessary before you can decide anything about (1) buying or not buying equipment, (2) whether or not to borrow money to buy it, and (3) where and how to borrow if you do borrow.

In other words, you must understand your own financial situation. The only place you can go to for this kind of information is to yourself—your own records and your own judgment. Of course, you then may want to get advice from a number of good sources before coming to any final conclusions.

About Cash Purchases and Bank Loans

Purchasing machinery out of cash may be your best move, if cash resources are sufficient to leave a sizable working balance after your change-over is completed. Any new equipment which tends to make a serious dent in your company's bank account will, of course, call for very close scanning.

In short, a good cash position is a necessity. Lack of it could make it difficult for you to meet emergencies. You might be "too short" to cover purchase of supplies and materials. Or you might be restricted in putting your new facilities to their best uses.

As not uncommon today, your bank may have let you know it can't be counted on to supply funds quite as freely as it used to, since demands are being made on it by so many of its customers.

You do want to give full consideration to a second method: Securing a short-term bank loan. This has several advantages, especially where you need not capitalize your purchase (of supplies, for example). And the charge against your current income will save enough or nearly enough in tax outlay to enable you to repay the bank within its term (probably 90 days). *(Turn page)*

On major equipment, however, don't make the highly optimistic assumption that increased profits will more-than-cover fast repayment. This could work out uncomfortably where payments are too large or crowded into too short a period, also where anticipated work is delayed, etc.

Where low interest rates can be arranged, this type of equipment financing has the additional advantage to you of a fairly low cost.

But you do not want to tie up your total available credit to an extent that may later cramp you—"high-caloric" yield or not. Things could happen calling for an immediate unsecured loan—a loan that may not be forthcoming because of existence of your previous equipment loan.

Using the Other Fellow's Money

Let's assume you are *not* prepared, at the moment, either to commit your own precious operating capital or to call upon your bank. Still you *can* make use of others' funds. Namely, funds from your customers, and from your suppliers.

Perhaps your customers will be somewhat unwilling to take part in this endeavor. They may feel they need the dollars as much as you do (and probably they really do need them). If this is the case, you likely won't want to jeopardize your relationship with them by asking.

But in many cases today, your suppliers are encouraging you (as a matter of sales policy) to make use of their facilities for carrying your obligations—as, for example, in acquisition of their equipment.

If you can work this way without impairment of credit, and the terms suit you, you'll do well to consider such a plan. In turn, these suppliers (manufacturers and dealers) will likely lay off your obligation with one or another of the good industrial financing companies that are familiar with such time payments and lease papers.

That brings up the pros and cons of leasing and of installment purchase—probably the two most rapidly growing methods of using equipment dollars. In truth, neither is an "easy" way. And here we can all agree that it's still hard to get "somethin' for nuthin' " in this hard world.

Why lease? Well, there's no single answer. Each company has its own reasons. And depending on the situations, each may have hit upon quite different conclusions during the good many years that leasing programs have been made available.

In the past, the principal reason for leasing has been conservation of working capital, in which respect leasing and purchase on extended terms serve exactly the same purpose.

Perhaps it's not too easy to get your finance committee or board of directors to approve (even for a good-sized company) a purchase of, say, $100,000 worth of equipment. But you can, maybe, fit a charge of "only $2,000 a month" into your operating budget. So you lease. Or buy on extended terms.

There is, however, a hidden vice here, from the user's standpoint: If you make an initial payment (whether on a lease or a purchase, it makes no difference) of a tiny amount—say, one month's payment in advance—then you have a remaining obligation greater than the value of the used equipment.

And if you contract for 10 yr., say, when a proper term might be 5, you similarly find yourself a user of machinery on which you owe at all times more than it's worth.

Certain leases do offer payments that may count as operating expense and thus be deductible from income before tax is calculated—that is, if the lease is a true one (not just a disguised sale).

However, current regulations permit depreciation over normal life to be calculated on the double-declining-balance or sum-of-digits formulas, instead of the straight-line formula.

As illustrated in our example (see accompanying panel), this enables the user of new equipment to depreciate it more rapidly. So on this score there's less inducement to rent.

Some accountants also hold that future operating expenses (classifying lease obligations as such) are not fixed liabilities, and therefore do not affect a company's credit standing. There is, of course, a lot to be said on *both* sides of this question..

Many accountants, as well as others, consider that an obligation to pay rent for equipment which will later be permanently acquired is, constructively, the same thing as a commitment to pay installments of purchase price, and therefore does have to be noted in your financial report of the equipment.

From the seller's standpoint, leasing can be a stimulus—a sales aid. And manufacturers have published impressive figures on this.

At the end of a leasing period, the user must re-examine his position: Does he want to turn the equipment in? Or does he want to go on using it (if he has that option)? If he turns it in, does he want to lease fresh equipment? Or does he want to buy?

You can see from this that there is a sort of automatic built-in resale or re-lease opportunity for the seller.

Leases Come in All Kinds

What types of leases are there? Almost as many as there are leases. In general—

A—Long-term leases having no renewal or purchase options:

The lessee (user) has no equity in the equipment at any time during the lease, nor any opportunity of acquiring such equity. And as for the yearly costs, they don't represent a capital investment, hence generally can't be considered as non-taxable.

B—Short-term leases having no renewal or purchase options:

These are really just rental agreements, and the monthly charges are necessarily relatively high. They generally don't run for any specified period of time, and are cancellable on, say, a day, week, or month's notice. Payments must cover costs of insurance, equipment maintenance, and other expenses, while providing money for equipment replacement, plus a profit for the owner, of course.

Materials handling equipment and certain processing machinery are leased in this way to various food companies. For example, a canner may rent lift-trucks just for use during his packing season (not needing them year-'round).

C—Long-term lease with option to buy:

This is preferred by some users, because they feel that they can build up an equity in the equipment and so don't keep paying over a long period on something they never actually get to own.

In other words, they like to have their cake and eat it, too—a not-often-feasible way to get your "calories." For many have found that this type of lease becomes, for tax purposes, a deferred payment contract, and what they gain in one direction they lose in another.

What are the clauses in a lease? There are many, but principally—

a. The time clause: How long the lease is to run.

b. Options: To purchase, or to renew.

c. Payments: First, the initial sum, or advance payment. (This may be 20 to 25%, or even more in the case of special-built units. In some leases it is just one month's rental payable in advance.) Second,

the amount of the monthly rental.

d. Insurance: Usually this is a cost to the user, even where the owner takes out the policy.

e. Maintenance: The user generally pays all these expenses. This has some advantage with labor. For your local union might object if the maintenance were performed by somebody from outside.

f. Default: If the user defaults on any provision, the owner usually can demand strict compliance with the terms. And failing to get it, he can go to court to recover full payment, to obtain return of the equipment, and to get reimbursement for any expenses incurred in insuring the user's adherence to the contract.

g. Others: Miscellaneous provisions include the user's payment of freight charges for the delivery of the equipment and its return—in a reasonable state of repair, and without removal of insignia or lettering identifying the lessor (owner).

The user must assume all risk and liability for equipment while in transit, storage, or operation, and must permit the owner to inspect the equipment on request.

A Look at the Tax Angles

What are the tax effects of various types of leases?

Well, there's a big question as to the Government view regarding lease payments as against depreciation write-offs. That is, when is a lease not a lease? And when is it really a purchase? The Internal Revenue Service and various courts have held different opinions.

Not being an attorney, accountant, or tax consultant, we don't pretend to give you the gospel. Granted, we could quote several bushels of material. We could study cases like *Bowen vs. Commissioner*, 12 *T.C.* 446 (*Acquiesced*), *W. H. Hughes vs. Commissioner*, 11 *T.C.M.* 797, and *Alexander W. Smith, Jr. vs. Commissioner*, 20 *B.T.A* 27. But possibly we'd be little the wiser for purposes of specific application.

Internal Revenue's *Tax Guide* puts it in a nutshell:

"If you . . . decide to lease equipment, you should make sure whether the agreement under which you lease is in reality a lease. If the agreement is a conditional sales contract . . . you may not deduct . . . payments as rentals, but must capitalize them and recover them through deductions for depreciation over the life of the asset . . . *Whether the agreement . . . is in substance a conditional sales contract depends on the intent of the parties as shown by the provisions of the agreement, read in the light of the facts and circumstances existing at the time the agreement was executed.*" *

That's the nub of it, I think. Meanwhile, Internal Revenue informs me that its Bulletin No. 35 (Aug. 29, 1955) is still the latest, and no amendments are currently expected. This publication contains the pertinent rulings (55-540, 541, and 542).

Purchase on Extended Terms

To boil it down, if you want to lease for tax reasons, be sure you have a real lease. *If you don't care, and are only interested in your working capital position, then buy on terms.*

In either case, make an initial investment that's sufficient, at least, to cover your loss of value in the equipment due to immediate real (not tax) depreciation as it becomes used equipment.

And have your payments run high enough so you aren't carrying a larger balance than the equipment is worth. Remember, the longer your payments run, the more dollars it costs you in finance charges.

The major points regarding purchase on terms (as against leasing) are:

1. You own the equipment at the end of the deal.

2. You are under no illusions as to tax deductibility of payments: Interest costs are tax deductible and payments of principal are *not*.

3. Present depreciation schedules are sufficiently rapid to approximate rate of depreciation charge-off.

4. You cannot, however, "pay out of depreciation" (as some users put it). Depreciation being a charge against income, you can't pay anything "out of" it. Your payments cannot even be the same *amount* as tax-savings-through-depreciation. This is because: (1) You have to make an initial payment, (2) your term is almost certain to be less than the tax depreciation life of the equipment, and (3) your tax savings are, of course, only a percentage of your depreciation write-off.

You can, of course, scale your payments by the same sum-of-digits formula you use to calculate depreciation. There is no big reason you should not do so, and quite a few in favor of it.

In short, the choice of methods for using dollars to modernize your plant and acquire equipment is up to you. Pick the one that fits best.

What are the fine details on establishing a long-range financial program for fullest, economical utilization of modern plant and equipment? Author Salinger supplies the answers in his concluding article. Watch for it in an early issue of FE.

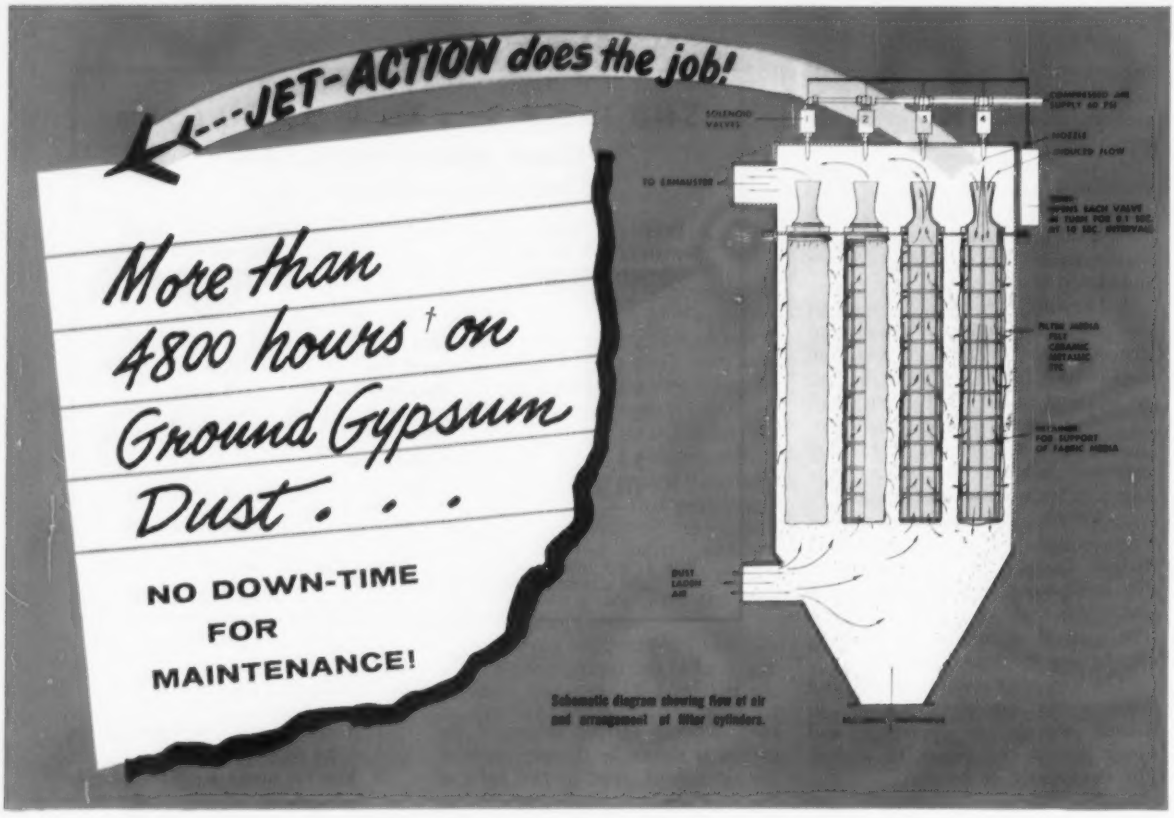
S-of-D Formula Gives You Quicker Depreciation

Assuming equipment costs you $10,000 and tax-depreciation life is 6 yr. —

Straight-Line Formula Depreciates ¾ in 4½ Yr.		But Sum-of-Digits Formula Depreciates ¾ in 3 Yr.
$ 1,750	— First Year —	$ 3,000
$ 1,750	— Second Year —	$ 2,500
$ 1,750	— Third Year —	$ 2,000
$ 1,750	— Fourth Year —	$ 1,500
$ 1,750	— Fifth Year —	$ 1,000
$ 1,750	— Sixth Year —	$ 500
$10,500	— Total —	$10,500

Note: Salvage values are omitted in these calculations, since they are the same regardless of which formula is used.

* From p. 40, *Tax Guide for Small Business, 1956*, Publication #334, Internal Revenue Service, Treasury Department. —D. L. S.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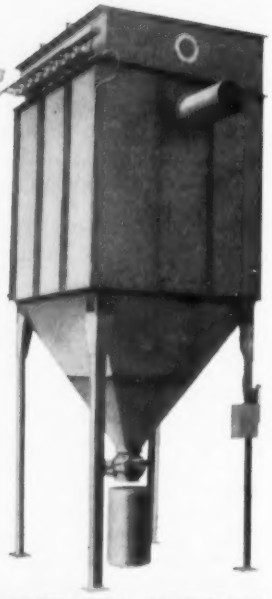

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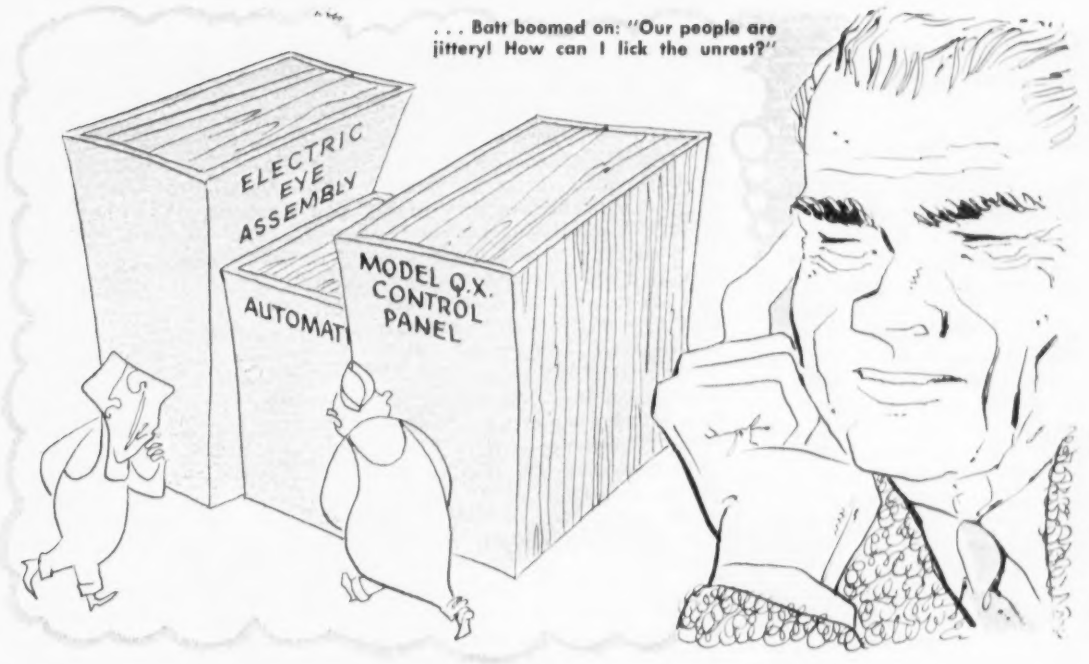


What Questions are Posed by *Automation?*

IVAN C. MILLER
"Food Engineering"

"I'M IN A REAL MESS! And it's getting bigger by the minute! I sure hope you boys can help me out!"

Thus, the usually belligerent Batt Bulwark, works manager of Mull & Mull Co., appealed to his fellow Guff & Gripers at the monthly meeting of the luncheon club.

"Well, Batt," came the chiding voice of Barney Hasbrook, "when you admit to having obstacles you can't over-ride, it must be awful."

"*Automation* scare!" sputtered Batt. "You all know how we're moving along on our modernization at M&M." Several nodded, and Batt continued: "Well, in the last two weeks a lot of crates of new machinery and equipment have come in, assigned to both the plant and office.

"Trouble is," Batt complained, "our employees spotted the markings on several of the boxes. So now the rumor's around that some of our workers are sure to lose their jobs 'because of automation.' Fact is," Batt grumbled on, "they don't know any more what automation is than I do. But they're sure scared of it—same as me."

"Well, tell us, Batt," said Barney, "are you people *really* going in heavy for automation? And if so, are you planning a big layoff?"

"Quite the contrary!" bellowed Batt. "Of course, we're adding some instrument controls and labor-saving equipment, just like we've done for years when we could afford it. But it's been an age since we've had a real layoff—and we certainly don't face one today.

"In fact, one of our biggest headaches will be finding enough of the right kind of workers—of course, at prices we can afford to pay—when we put our new lines into operation." Then he banged his fist on the table and roared: "Blast these rumors!"

"When unfounded rumors persist," injected Ole Sage, "that's sure evidence of faulty communications—or none at all."

"**Communications!**" thundered Batt sarcastically. "That's just a $64 word with no real meaning. I sure hope we can tear into that subject at one of these meetings. But today can't we just throw some light on my problem with this thing called automation?"

Batt boomed on: "Our people are jittery, and I see plenty of friction developing. I know it's all the work of our doggone trouble-making union. What am I going to do? How can I lick the unrest?"

Batt's glare swept the table, then focused on Ole. "What's your opinion on automation? Don't you figure the same as me—that it was our union that stirred all this up?"

"It's probable it wasn't," Ole answered. But even though *your* local may in no way have caused the apprehension in *your* people, nevertheless union heads in general have accelerated the trend toward the labor-saving methods that are now called 'automation.' Furthermore, they're using that trend to cement security."

"How come?" asked Si Worth.

"Well," said Ole, "the demands by union management tend to speed movements toward labor-saving mechanization. Here, I mean their demands for constantly increasing wage rates, coupled with fewer hours of work, and the ever enlarging fringe benefits, which, in our industry, have come to represent 20 to 30% of the payroll.

"Only the word 'automation' is new in our long-time trend toward mechanization. It's just a recent grouping together of all labor-reducing methods, instrumentation, continuous and mechanical oper-

Ole Sage Episode

"Three out of four anticipate a transition to the automatic by 1965."

ations, and calling the whole business automation."

"But what about the . . . well . . . mechanical 'brains'?" persisted Batt.

"As for the electronic 'memory' machine," replied Ole, "it can be pictured as gradually entering our industry–first, for greater speed and accuracy in office paper-work routines, then for ways of working out rapidly flowing sales and inventory data, also problems of work scheduling, delivery movements, and such.

"Meanwhile, the simpler forerunner forms of automation have long been familiar to all of us. For instance, rather than employ men to open and close the valves, in our heating and cooling processes, we depend on instruments. The cost is less and the accuracy much improved."

"Then you admit," bristled Batt, "that these gadgets have replaced men on the valves?"

"Of course," came back Ole. "But that doesn't mean your valve men become permanently unemployed. The millions of control instruments in industry today haven't thrown millions out of work–rather, instrumentation has created other and better jobs for these people."

Si now shot in a question: "Do I gather from what you say that growth of food-plant automation–particularly like electronic computing–will be slower than in other industries?"

Ole reflected. "Well, right now the cost of electronic computers restricts their ownership to the larger food companies. Here, Heinz already has a 'Univac' and is running checks on it relative to such applications as payroll work, order-processing, accounts receivables, sales information, and inventory control."

"That's certainly getting at it," said Milt Sorenson. "But what are the overall views?"

"General Foods," replied Ole, "ran a survey bearing on that question among a group of food companies representing about half of the industry's employment. And here are some of the results:

"Three out of four of the top officials of these companies anticipate a gradual transition to automatic operations between now and 1965. These men foresee increased automation in their own companies and expect it to bring improved quality at lower production cost.

"Almost half of those questioned believe the greatest changes in their companies will come in the realm of research and product development. However, approximately half expect to see most changes in manufacturing and processing methods.

"About one in four anticipates large increases in company expenditures for research and development, while 63% look forward to moderate increases. None foresee any cuts.

"More than half believe that the development of atomic science will have a major impact on food processing during the next 10 years. Most comments here refer to irradiation for sterilization, although quality control, process control, and new process development also were mentioned."

Si Worth had a query: "Would food irradiation or, say, ultrasonic treatment, really be automation? And if so, will their use affect employment very much?"

"Both are expected to have far-reaching technical effects," said Ole. "But I think it's unlikely that either will have any very important impact on employment–not as much, anyhow, as the broad mechanization and instrumentation developments."

At this point, an older man seated at the end of the table spoke up: "I'm J. J. Talmerage, president of a small food company–and just a guest of your club. But I'd like to pose a question relative to the little-plant aspect of it all–my outfit being one with less than 100 employees.

"You've told us, Mr. Sage, that only the larger organizations can afford electronic computers. Now, won't that mean that they'll slowly force us small people out?"

"Well," said Ole, "Let's look at it this way:

"It would, for sure, be mighty difficult for a small company with just a few employees to successfully start building and marketing autos against the high-powered competition in our present economy. And there's no need to explain why. But on the other hand, many small food enterprises are begun in local areas every year–and a surprising number of them prosper and grow.

"Mechanization can play an important role in their growth–although it may be no more than a matter of shifting from hand trucks to conveyors. Such mechanization is usually the road to lowered costs for this smaller-type operator. Yet he may instead choose to carry on without extensive mechanization or instrumentation.

"However, the major organizations that must depend on widespread distribution haven't got a choice. These large companies must meet the pace of their field no matter how swift it becomes. That's the price of bigness."

Bertram Barnastian, usually just a listener, now got into the discussion: "What you've said strengthens my conviction regarding automation. Whatever our management views–or those of our employees or the union officials–automation does provide the only 'out,' since the average production per worker, nationwide, must increase greatly or the economy will collapse."

"How so?" queried Barney.

"It all hinges," pointed out Bert, "on facts we've covered before. Unions seem intent on reducing the retirement age from 65 to 60, thus cutting the work force by some 10%. And in the future, our military and vocational training, as well as extended scholastic requirements for the prework generation, will further cut down the work force in the face of rapid population growth.

"Regardless of all this, many unions now advocate reduction of work to the four-day week. And if they're successful in setting the retirement age down to 60, why won't they try to drop it to 55, despite the cut in the work force and the added cost of insurance to the employers?"

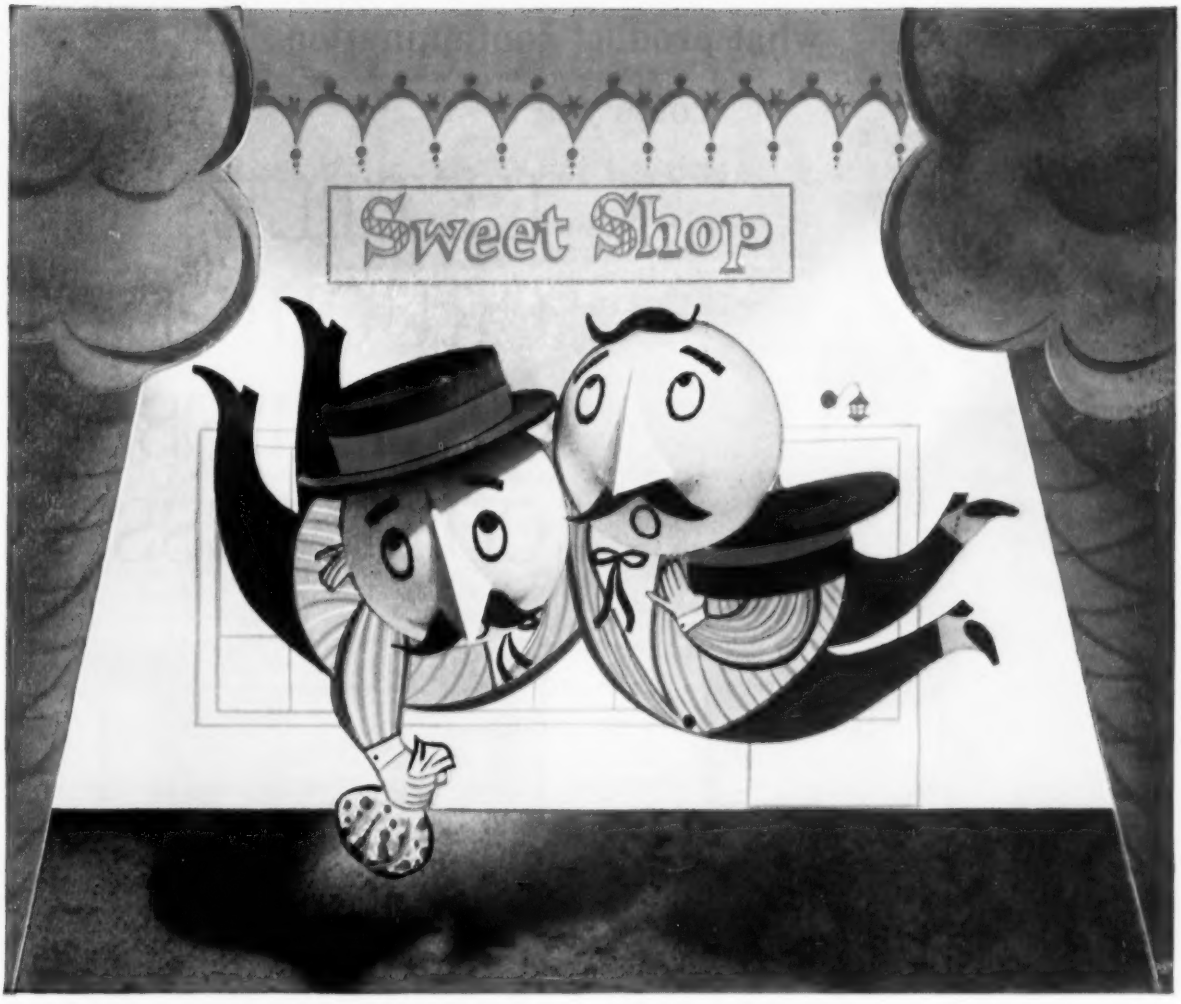
Bert went on: "It was on the expected reduction in employment due to automation that union management tried to justify GAW–guaranteed annual work–and then supplementary unemployment compensation. To me this all seems like putting the cart before the horse."

Batt was about ready to burst. And he now cut in: "All this is very interesting—*but what's it got to do with my big problem of smoothing out our Mull & Mull employees' unrest over automation?*"

Ole grinned: "This present problem of our good friend, here, is merely a matter of communications!"

"There you go again," barked Batt. "All these generalities about *communications!* We've got to get that subject torn apart so we can really see it. Let's get right at it in our next meeting!" —*End*

DOW



Harmony for sweet sales:

Palatone and Cyclotene

Dow flavor intensifiers work well separately or together—giving added sales-appeal to ice cream, baked goods, candy and flavors!

Music to your ears! Referring, of course, to the sales reports you'll hear when you use Palatone® and Cyclotene® in your products. Both of these Dow aromatics accent flavor—and sales—appeal!

Palatone® is one of the rare flavor materials whose aromas closely resemble their tastes. Its distinct caramel-butterscotch odor emphasizes the sweetness of most blends. Palatone is also successful in compounding rich vanilla and chocolate flavors.

Palatone and Cyclotene® work very well together as flavor intensifiers. Cyclotene has a maple-licorice flavor, with a suggestion of walnut, which highlights the customer appeal of ice cream, baked goods, candy, tobaccos and peanut products.

Technical bulletins and samples are yours for the asking. You'll be sales ahead by writing on your letterhead to THE DOW CHEMICAL COMPANY, Midland, Mich., Dept. FC 869H-5.

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when you consider

what product contamination

costs you

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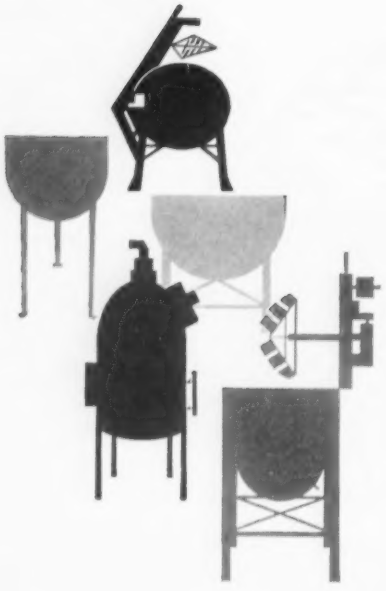

Install a kettle made of Crucible Stainless Steel and you're certain of this: it can't alter the flavor or change the appearance of food. It never takes flavor *away* either. It effectively resists the really harsh processing liquors and never chips, peels, or cracks. And no foods, no matter what corrosive acids they contain, can break down its smooth, shiny surface. That's why Stainless Steel kettles cut product contamination that wastes money.

It's this ability to save money that accounts for the growing impact of Crucible Stainless on the food industry. Cleaning is another good example: Stainless cleans 5 times faster than any other metal. And it comes clean so thoroughly that Stainless equipment can be used on many jobs — flavor never carries over from one product to another.

In the long run, the more equipment you have made of Crucible Stainless, the less you'll pay to process food.

To get more facts about Crucible Stainless, take either of these simple steps: (1) write for free 40-page booklet discussing the use of Stainless Steels in the Food Processing Industry, or (2) contact Crucible Steel Company of America, The Oliver Building, Mellon Sq., Pittsburgh 22, Pa.

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Your Food Broker...

★ What he is ★ What he does ★ How he does it

In today's fast-action operations, this very able "sales partner" rates tops in providing streamlined, economical distribution . . . Here are tips on choosing the marketer who's right for you, plus pointed hints on working with him

MOVING at a stepped-up pace, modern food marketing now spotlights food brokers as the outstanding food salesmen.

Put briefly, brokers have been active for more than a century and have long occupied an important position in the food industry. And today their role is even more significant—their contributions greater than ever.

Long utilized by a broad range of food manufacturers of all sizes, the broker, curiously enough, had still remained an unknown figure to a number of food producers. Many of the latter had traditionally sold though a salaried sales force and were not interested in other channels.

But today things are different—for developments have been moving too swiftly to permit any firm to smugly drift, still using obsolete methods.

The consumer's tastes have changed, and so have products and production methods. Machinery and equipment have been improved tremendously. And marketing techniques have been altered so radically that this present era has often been referred to as "the marketing revolution."

And so there has been a significant trend by food manufacturers to switch from company sales-staff operations to use of brokers. Also, many firms have moved over to brokers for introduction of new lines of products.

Numerous companies, too, have come into this medium through acquiring other companies that had been using brokers. They have generally tended to retain this broker representation instead of turning over the newly added products to their own sales staffs.

In short, they are recognizing the great value of brokers, as have so many other food manufacturers. They are finding that, though they have their own selling organization for some lines, the broker can do a sales and merchandising job on other lines that their own men couldn't achieve.

This Is the Modern Broker—

To get the picture, let's review briefly what a food broker is, what he does, and how he does it.

Today's food broker is not an individual, but a firm employing a number of trained salesmen working under the personal direction of the owner or manager.

The broker is the operator of an independent, local agency that performs the sales function and related services for the manufacturers—termed "principals"—that he represents.

He operates for more than one manufacturer. However, he does not represent competing firms without express approval of all concerned. Moreover, he maintains confidential relationships with each principal. A survey by the National Food Brokers Assn. a number of years ago showed that each broker represented an average of 23 firms.

The true food broker is strictly a sales agent—he does not buy or sell for his own account. Membership in NFBA is limited to such qualified food brokers.

In a local market, the broker is very close to the buyers. In the first place, he maintains a regular and frequent schedule of calls—generally at least once a week for major accounts. In addition, he makes frequent telephone and personal contacts.

The buyer has learned that he can depend on the broker for advice and service at any time, and so he does not hesitate to phone him. Thus,

WATSON ROGERS

President, National Food Brokers Assn., Washington, D. C. . . .

. . . draws upon long field experience in bringing you this sharp-focus picture of the food broker and his very important operations.

Appointed in 1946 as first salaried head of NFBA, he has done an outstanding job in creating closer relationships between brokers and manufacturers. His accent has been on the goal of ever-improved broker operating efficiency.

He spent his early career in food sales, starting in grocery wholesaling in 1925 after 2 years in a retail store. There followed 13 active years in sales and merchandising.

Then in the late '30s he organized and led the highly enterprising Oklahoma Retail Grocers Assn. Subsequently he was named to committee work with the National Assn. of Retail Grocers. And later he served as president of the National Retail Grocers Secretaries Assn., receiving a plaque from this group commending his leadership.

Joining NFBA in 1943, he served as executive secretary prior to being named president. Since those days he has seen this group's membership mount from little more than 1,000 to a record 1,850.

it can be said that a food broker truly represents his principal, and is always available to the buyer.

In addition, there is usually a close personal relationship between brokers and buyers. They visit each other socially, attend functions together.

The owners and managers of today's food-broker firms are top caliber sales executives. Actually, many have earlier been sales managers or executives of manufacturing firms. Their experience makes them the equivalent of district sales managers of the firms they represent.

Offer New Services

In recent years, these firms have made many extra services available to manufacturers. Fifteen years ago many manufacturers could not have obtained the kind of broker organization they now need for their products.

With the increasing importance of the supermarket, along with the wholesale grocer's concentration on warehousing and straight selling, the broker has been forced to expand his operations. Thus many manufacturers now use brokers more extensively.

For instance, a manufacturer may employ a network of from 70 to more than 100 broker firms to achieve or maintain national distribution. Behind such a network is a small army of many hundreds of trained salesmen, all representing that manufacturer and spreading the gospel for his products.

The *U.S. Census of Business for 1954* compares food-broker growth with that of other sales-branches utilized by the industry. Whereas manufacturers' sales branches and offices combined showed a rise in sales volume of 14%, that achieved by food brokers was 47.

All wholesale buyers in the grocery field are sold by the food broker. Included are wholesale merchants, chain stores, supermarket groups, and industrial users. Prices, terms, and all other conditions of sale, are set by the manufacturer. The broker does not have authority to change any of these unless so authorized by the principal.

Responsibility for granting credit to buyers rests with the manufacturer. He sets terms and limits. The broker aids him by recommendations, based on a knowledge of the local buyers and their credit standing. He also reports changes in these conditions which might affect the principal's welfare. The broker also aids his principal in collections of delinquent accounts.

He's a Merchandiser, Too

In addition to product selling, the broker also promotes the value of his principal's advertising programs to buyers, he points out that it is to their advantage to tie-in to such programs. He also promotes special deals and promotional functions developed by his principals.

He provides his manufacturers with market information pertinent to their sales. He also reports on competitors' activities, special promotions, and other situations. And so, he is in frequent contact with his principals—by phone when necessary.

Relative to reporting services, however, most principals do not require unusual, unnecessary, or time-consuming reports. All manufacturers recognize that there should be a minimum of distraction from the broker's all-important sales activities.

Principals need only let their brokers know just what kind of information is needed from them. However, it is desirable not to burden the brokers.

A great advantage of brokerage distribution is that the principal knows his selling cost in advance. Thus he can include this figure with the costs for the rest of his operation —knowing there won't be unforseen fluctuations.

He's Paid for Extras

There are several ways to determine payments for services other than sales. General practice is for principal and broker to work out a method by mutual agreement. The principal, of course, may handle it by different methods with different brokers.

Here are the most common basic agreements:

A—A single percentage rate computed to cover both payment for sales work and payment for additional services.

B—A percentage rate for sales work and a separate percentage for extra services.

C—A percentage rate for sales work and a specified dollar figure for other services.

For example, many brokers make retail merchandising services available on a cooperative basis, whereby three or four firms share the expense of a retail-merchandising man or crew. Here, payment would be computed on the basis of a dollar rate per man, per week or month. Similar arrangements are made for other special services.

Clear advance specification of the method is essential in order to avoid subsequent questioning by either principal or broker.

Spell Out the Terms

The agreement of agency (contract) should, of course, be written, succinctly spelling out all the terms. This would include rate of brokerage, territory covered, products to be represented, and sales fields to be covered. And it's pertinent to outline the principal's basic policies.

The manufacturer should set up a system of regular payments and out-

line it to the broker. It is recognized that this routine will have to comply with the manufacturer's accounting procedures. The exact period of the month in which the payment is made is secondary, so long as the broker knows when it is.

Principals Determine Territories

You will note that in their regular operations certain brokers are covering certain areas. But actually there is no hard and fast demarcation of broker territory, as is sometimes expected by a manufacturer newly considering brokerage. This accents a prime point: In truth, the area-flexibility is an advantage to the manufacturer, because he can thus shape up the kind of brokerage network that best fits his needs—local, regional, or national, and to whatever extent is most suitable.

For the small manufacturer who's not geared today for national distribution, but headed for it tomorrow, this is the best means for developing a progressive program.

Status of his financial and plant resources tells a manufacturer what his productive facilities can provide With this as a starting point, he can select the areas in which he wants to sell. Then, as he builds his distribution and increases his production facilities, he becomes ready for sales expansion. He then can add brokers in other areas.

He has the advantage of moving as fast as he wishes, at a pace he himself decides. He isn't forced to expand his markets sooner than he is physically able to produce the goods. Nor is he sacrificing productive capacity for lack of a capable sales force.

How to Select Brokers

In choosing brokers, no definite decisions should be made until after interviewing the qualified firms in each area. These interviews provide information for making a selection. Having previously outlined his specific needs, a manufacturer can then evaluate each broker's ability to meet them.

An aid in plotting territories where brokers are needed is the *NFBA Directory of Members*. Listing food brokers by cities, it offers very handy starting-point data.

Making It Equitable

Relative to payment, the manufacturer should be realistic. He must consider that the commissions to brokers must economically justify the handling of his account. He must recognize that the broker has to maintain relationships with other principals. This latter factor actually provides a great advantage to manufacturers—because it is only by handling several principals' accounts that brokers are able to operate at lower cost.

When contacting qualified brokers, the manufacturer's representative should have available all data the broker requires—detailed descriptions of all products to be sold, prices, terms, quality, merchandising and advertising plans, deals, information about the company, etc. The representative should be capable of describing plans for additional products and programs for the broker planned for the future.

Your Broker Is Your Partner

Key to best results with brokers is cooperation by the principal. A manufacturer should look upon his broker as his partner. Both have mutual interests. If one prospers, so does the other.

It is important for principals to keep their brokers informed on such matters as changes in prices, products, labels, terms, policies, operations, also sales techniques and methods that others are using successfully. Reports to the broker showing cumulative sales totals and comparisons for the different products also are valuable.

It is essential that brokers be apprised of special deals, promotions, advertising plans, etc., well in advance. They need time to pass this information on to their own staffs. They should also have ample time to contact the buyers to make sure that they cooperatively tie-in with such promotions.

If quotas are used, they should be realistic – possible of achievement in line with the actual situation. Brokers are realists and can readily detect meaningless quota figures. But quotas properly used may be valuable.

Good Liaison Is Vital

It is important to use qualified, management-level contact men for close relationship with brokers. Regional supervisors or managers are generally assigned by principals as field men. The number depends on the firm's organization, policies, and present setup. Often, the firm's current regional sales organization fits in this supervisory niche.

People who contact the brokers should be of the same sales-manager caliber as the executives of the brokerage company. Occasionally, a firm may appoint a contact man who doesn't have the qualifications. Such a representative cannot gain the desired results with brokers or potential customers.

The regional manager should not press his contacts in such manner as to interfere with the broker's operations. He should give adequate prior notice if he intends to visit the broker, so that necessary planning and scheduling of work and calls may be arranged. He should not expect a busy broker to cancel other appointments, or to stop all activities of the office, just because of his unexpected appearance.

Occasionally, it might be desirable for the regional manager to accompany his broker when making calls

" . . . today's food broker is not an individual, but a firm of top-caliber sales executives keyed to operate in an era when developments have moved too swiftly to permit any manufacturer to smugly drift."

" . . . he sells all wholesalers in the field, providing a wealth of market information, also many extra services. And you know your costs in advance."

" . . . on performance: Brokers' sales volume have shown a 47% rise."

" . . . in almost every case, a manufacturer can reduce his costs through broker operations, and there are many intangible benefits."

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the ability to withstand greater physical abuse and thermal shock while providing the complete corrosion protection required by different food processing operations and varying plant conditions. They also present the attractiveness and beauty of the traditional 6" x 6" pattern. Atlas "Individually Engineered" food plant floors are custom designed to meet your specific needs.

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Write today for the booklet, Food Floor Facts, giving complete information. Consult the Yellow Pages for your local representatives.

on buyers. These should be planned in advance with the broker. Most important of all when making such calls, the principal's contact man should have something of value to contribute. Buyers resent visits "just to thank you for your business."

A regional manager should know what his brokers are qualified to do. He should know what they have agreed to do by the terms of their contracts. And he should show the brokers that he's interested in helping them and their sales staffs to do a top-notch job.

The Cost Is Low

One of the basic advantages of operating through brokers is the demonstrated low sales cost. We would say that in almost every case, a manufacturer is thus able to reduce his sales costs.

Our space here doesn't permit detailing of all the figures. And averages cannot really show the true picture. However, on the basis of Census data, we can say that the costs of marketing foods through food brokers represent about one-third those of utilizing a salaried sales force.

This doesn't reflect the manufacturer's additional operational savings. Various intangibles, such as the burden of managing individual salesmen, are eliminated. Personnel turnover is no longer a factor. And personality problems are minimized.

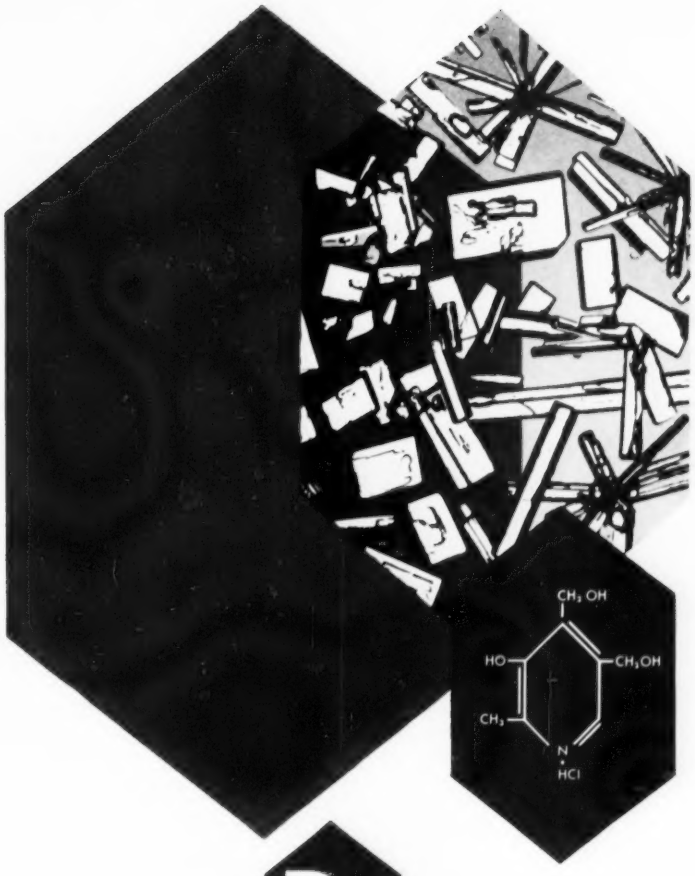
Furthermore, sales-staff record keeping isn't necessary. Nor are expense accounts maintained. Still other saving factors will come to mind.

Particularly vital to the manufacturer is the broker's ability to provide him with the sales volume measuring up to his desired market potential. The broker's regular, frequent contact with buyers, his close personal relationship with them, and his intimate knowledge of the local market enable him to obtain top sales volume.

The food broker's position in the field is stronger than at any time in the past. Sales-scope is the reason. The potential is now tremendous. At the same time, competition is greater than ever.

The value the manufacturer receives depends on his own caliber plus his broker's qualifications to sell specific products. Most firms find that they can best maintain a sound, strong market position through food brokers—and at reduced sales costs.

—*End*



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Metabolic imbalance in pregnancy

Pyridoxine's particular place in the metabolism of tryptophane and other amino acids may be significant in correcting certain metabolic imbalances known to exist in some pregnancies.

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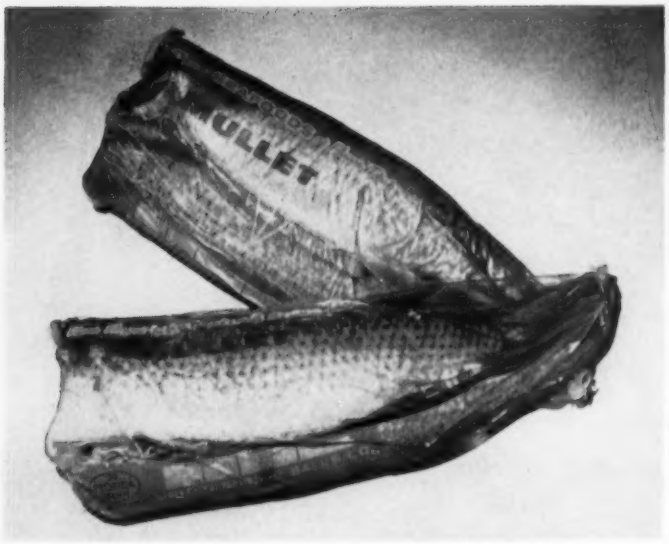

SALES PROMOTER: Packaged in attractive skin-tight film, frozen mullet have really caught on in the Florida market. Already, sales are up 600% and distribution is spreading fast.

New Pack Boosts Mullet

Quick-freezing the fish converts one-time 'drug on market' to fast-moving item. Latest packaging and distribution know-how applied

C. E. WRIGHT
FE Correspondent, Jacksonville, Fla.

WHEN it got really tough to market mullet, Florida came up with a neat answer—freezing of the fish in attractive heat-shrinkable plastic packaging.

Specifically, annual production was way down from the World War II peak of 56 million lb. And cash return to processors had fallen from 15¢ per lb. to as little as 5¢.

That situation impelled U.S. Fish & Wildlife Service and U. of Miami's Marine Laboratory to launch a market research. And this indicated good sales potential for a frozen product in an attractive, functional package. Supporting this view were the availability, low price, and ease of mechanical handling of the mullet.

The challenge was taken up by Jacksonville Freezers Inc., Jacksonville, whose processing and distribution know-how quickly created a new market for mullet.

Now, the frozen product is in grocers' cabinets three days after the fish is caught. And sales are up a whopping 600%!

Initial distribution was through 70 stores of the Winn-Dixie chain in Jacksonville and surrounding areas. Eventually, more distant outlets of that chain and other supermarkets will be served.

Sales and distribution are handled by an affiliate company, United Shrimp Sales Co. of Jacksonville.

Process in Brief

Mullet, arriving at the Jacksonville plant in iced boxes, are cleaned by removing scales, heads, and entrails (Waste is sold for cat food).

After a second wash, fish are packaged in four vac-sealing units and a shrinking tunnel (Cryovac Co., Cambridge, Mass.). Sealed bags next pass through the tunnel (containing 205F. water) in about 5 sec., and are shrunk to a skin-tight fit. Then product goes to a blast freezer operated at about —30F.

Product is distributed in 15-25 lb. master cartons.

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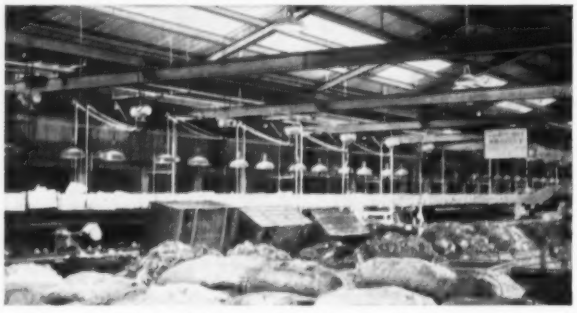

Butler canning shed with horizontal steel beams added to support the electric hoists that carry produce to the conveyor.

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Butler buildings are spacious, functional—ideal for the efficient production, storage and shipping of food products. Butler's flexibility of usage provides you with low-cost field storage, safe, sanitary warehousing and efficient refrigerated storage. The spacious, post-free interiors give you a plant with complete freedom so you can arrange your production lines any length, any width for maximum efficiency.

Whether your Butler building is to be large or small, all metal or partially conventional building materials, it offers you these advantages: fast erection, easy, economical expansion . . . truss-free gables and post-free interiors up to 100 feet wide . . . fire-safe, wind-safe, vermin-proof . . . economical to heat, ventilate, illuminate and maintain.

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MARKETING SIGNALS

Zealous FDA Stymies Promotion

Marketing implications of far-reaching significance are involved in the case of the "Buttermilk Bread." It means that food manufacturers' hands are tied in labeling and promoting foods covered by federal standards.

Here's what has happened: FDA last month obtained a temporary injunction against Continental Baking Co. to stop interstate shipments of white or enriched bread labeled "Buttermilk Bread" or "Buttermilk Enriched Bread."

The injunction also prohibits the use of nitrated flour (not permitted by the standard).

Continental is complying with the injunction, and all bakers are urged by FDA to review their bread labels and formulas in light of the District Court order.

The government's reason for the crackdown is "to prevent consumers from being misled and competing firms from being forced into similar practices."

Is this an overdose of official zeal, or bureaucracy? Some think so. Certainly FDA is splitting a hair when it crosses "buttermilk" off the label of a product containing dried buttermilk.

Retailer-Packer Escapes FTC

Chain stores that have meat packing operations, no matter how small, are out from under FTC's trade practices thumb. And FTC has dismissed charges that Food Fair Stores induced illegal advertising allowances from suppliers.

By virtue of FTC's ruling, chains with meat plants come under the jurisdiction of the U. S. Department of Agriculture. How long this will last is questionable. The ruling will add impetus to legislative moves that would prevent any chain from escaping FTC regulation —packing operations or not.

Heinz Sets Institutional Pace

Going all out after the mass-feeding industry market, Heinz has 300 salesmen in its special Hotel & Restaurant Division, and it uses several types of food distributors that contact the field.

Backing up these forces are 4-color spreads in 14 merchandising, institutional, and professional publications—primarily to find good qualified prospects. A different product is advertised each month to spur the sales drive.

With this technique, five monthly selling efforts shattered all previous records for the product featured.

Market Mergers Hang in Balance

Outcome of FTC's case against Foremost Dairies should be known in near future, and it will affect the plans of other food companies to broaden distribution by acquisition of local firms.

FTC wants the dairy to turn loose its properties in the West and in "off-shore" areas. The government is concerned about what it calls the increasing concentration in the distribution of dairy products.

Beatrice, Borden, and National Dairy also have been under the charge of Clayton Act violation since last fall. However, no company taken over by these firms is as strong in a regional area as is Foremost's West Coast acquisition, Golden State Co. It was California's largest dairy distributor when taken over in 1954.

Ups Budget to Sell Milk to Adults

Aimed primarily at the adults—biggest potential market for milk—a new ad campaign built on "Milk makes energy" will be conducted in 1958 by American Dairy Assn. The budget is up 11%, to $6,200,000.

More than $1 million will be spent for newspaper advertising, an increase of 50%. Better than $3 million will buy TV time—the Perry Como and Casey Jones shows.

Something under $1 million will buy advertising in magazines and trade publications.

What is left will go into spot radio network commercials, point of sale merchandising, and promotion work with retailers.

"Only real butter has true natural taste" will be the theme of butter advertising.

MARKETING BRIEFS

Will food money be "squandered" on other things in the future? Could be. Grand Union Co. will set up nine one-stop markets in the next 16 months. In addition to food, these will handle everything from apparel, garden supplies, and outdoor furniture to appliances.

To capture more of the adult market for cereals, Kellogg and Quaker Oats are promoting high-protein cereal breakfast foods. This contrasts with the use of "gimmicks" for cereal promotion to youngsters.

"Try all three—get all three free." That is the initial promotion used to launch three new soups by Campbell. The firm reimbursed consumers when they sent in labels from each of the three items—turkey noodle, minestrone, and chicken vegetable soups. This promotion was backed up by ads, principally two-color, in 278 newspapers and 175 major markets.

General Foods is after institutional business in a big way. It has a new line of products created especially for the mass-feeding industry, and it is putting increased selling power behind it.

More and more emphasis is being placed on processed products by the meat packers. With their value-added-by-manufacture, these items offer better profit margins and lend themselves to brand promotion.

Using advertisements in 240 newspapers in over 200 cities, Beatrice Foods is putting a particular push behind Meadow Gold ice cream. Its advertising budget exceeds $5 million, or 1.5% of sales.

New scientific data on the nutritive values of canned foods has been published by National Canners Assn. The 8-page leaflet tells how canned foods may be used in modern menu planning and meal preparation.

Thermoformed Plastics Add

No longer a gimmick, rigid and semi-rigid plastic containers stand ready to put new zip in the battle on the retail shelves. Some packages are now in action—and more are coming off drafting boards every day to give food packers new weapons in the skirmish for utility and convenience

FE STAFF

FUTURE packaging authorities may well cite 1957 as the year when rigid and semi-rigid plastic food containers finally reached maturity.

—That is, the time when thermoformed packages left the gimmick stage and became established as functional, economic containers.

True, actual use of these plastics in commercial food packaging is still very limited in quantity. But drawing boards at all plastic converting companies are loaded with new ideas. And processors—under constant pressure to improve their product's competitive edge through packaging—are gradually turning to thermoplastics to solve their problems.

The situation is healthy. For current action on plastic containers is based, mainly, on their functional values—which in many cases can't be duplicated in any other packaging material.

Some ideas are already in commercial use, others are just around the corner. Take these:

▶ **Plastic "cans"** with heat sealed lids will offer convenience in opening and cut store rejects stemming from leakers and dents.

▶ **Squeezable tubes, "cans", and bottles** offer utility in dispensing, and may be equipped with attachments for home decorating of party foods.

▶ **Clear trays** for meat, poultry, and frozens provide an all-around look at the product and whet impulse buying.

▶ **Unbreakable tumblers** – actually flecked with sparkling grains of metal—can stimulate appearance of cheeses, spreads, peanut butter, jams, and jellies.

▶ **Decorative cups** for one-unit servings of spreads cut waste in the institutional field.

▶ **Plastic aerosols** may provide a super-safe container for pressurized foods.

▶ **Combination packages,** utilizing plastic for closures and windows, give a peek into hitherto unseen foods.

▶ **Practical plastic containers** for ice creams, potato and fruit salads, and cheeses live a double life—first, as eye-catching displays in retail stores, then as re-use items in the home.

This latter point, however—re-use value—must undergo some strong revision if plastics are to make much of a mark in rigid packaging.

Re-use of any container is very limited, and consumers must be educated to consider plastics throw-away items—like any other package—or sales will inevitably slacken.

With this fact firmly established, plastic containers can be made considerably cheaper through thinner, one-use construction. Result: Packages more competitive in price.

As this trend continues, and volume of plastic containers increases, suppliers predict that prices will steadily fall. Since many such containers now cost only slightly above other forms, the drop will place thermoformed plastics in a hotly-competitive position.

Plastics in Thermoforming

In the struggle to gain recognition of rigid and semi-rigid plastics as good packaging materials, probably the chief actor—though certainly not the oldest—is that ubiquitous performer: **Polyethylene.**

Just as this material has played a big role in film packaging, so it is spearheading new moves in the thermoforming field. Development of high-density polyethylene—now trickling into production—will increase its importance.

Styrene—in general purpose, high impact, and biaxially oriented forms—also promises to be a big food-field performer, and is already in solid commercial use.

Cellulosics (cellulose acetate, ethyl cellulose, and butyrate) should in-

CRISP DESIGN heightens effect of new polyethylene tubes for cheese spreads and toppings. Containers are filled and sealed on special equipment resembling toothpaste fillers.

New Food-Packaging Values

crease their role as a result of new FDA-approved plasticizers and development of machines for high-speed economical forming, filling, and sealing of small cups and blisters.

Acrylics, and thermosetting plastics such as **phenolics, ureas,** and **melamine,** are too expensive for general container use. But, they are employed for closures, and might find application in luxury packages.

Polyethylene—Durable Performer

A front runner for rigid and semi-rigid package applications is polyethylene. Highly durable, this plastic has a low water-vapor transmission rate that can be even further improved by newly developed polymeric and varnish coatings.

Because it has excellent flexibility, polyethylene is extremely adaptable to formation of tubes, squeeze bottles, and "cans." This flexibility also permits molding of hinges as an integral part of tray containers—eliminating complex molds and separate pin-hinges.

Light weight of the plastic, compared to standard containers, reduces shipping costs. And its strength practically eliminates losses from breakage. One major manufacturer has studied the comparative situation and states that while glass jars are one-third to one-half cheaper (in his case), costs based on "in-store delivery" are actually less for the plastic.

The container price difference quoted above, however, is extreme. For one plastic supplier claims that its polyethylene tubes and bottles range from 10% under to 7% over the price of competitive containers made from other materials.

Following up this advantage, plastic tubes have gained a solid toehold in our modern food markets.

Biggest convert to date is Swift, which has launched a successful line of cheese spreads in tubes. Others who have leaped in are: Garland Foods, Los Angeles (cheese spreads); Krim-Ko Corp., Chicago (dessert toppings); and Shasta Water Co., San Francisco (toppings).

Big advantage of these containers (made by Bradley Container Corp., Maynard, Mass.) is their easy-dispensing, and the fact that—unlike

POLYETHYLENE lends itself to a wide variety of shapes. Metal-ended "can" (left) and all-plastic bottles (center) are suitable for nearly all liquid foods. Film-sealable cup (right), made from linear polyethylene, is considered a strong possibility for heat-sterilized products.

UTILITY is main feature of tubed foods. Special fitments can convert package into a decorator for pastries. Container maintains original shape throughout use.

THIS SQUEEZE BOTTLE is already in use for artificial sweeteners. It makes an attractive table server and can be designed to dispense in either drops, spray, or stream.

NOVEL CUBICAL PACKAGE of polyethylene is projected for bulk shipment of institutional liquids. Corrugated case has die-cut handles. Heat-sealed spout is snipped off for dispensing.

CUPS comes in regular or high-impact styrene. Glass (center) has metal flecks that make it attractive re-use tumbler. Closure (right) is used on paperboard ice cream cartons.

ACETATE with FDA-approved plasticizer enters the food-packaging ring in either cup or blister forms. Jelly pack (right) is first example on market.

their metal counterparts—they retain their original shape throughout use, thus keeping an attractive display surface. They're available in sizes from ½ to 10 oz.

In the design stage are added fitments that convert the tubes for dispensing cake icings and cheese spreads in fancy shapes—a time-saving boon for today's hostess.

On the negative side, the tubes pose some problems that are now in the process of being solved. For one thing, they are difficult to display on the grocery shelf—an upright position is essential. Also, the American consumer has a penchant for pinching and unscrewing unprotected containers.

Kraft has found a solution to the first problem—a corrugated display case that holds the tubes vertical. Krim-Ko has licked both problems by skin-packaging the tube on a punched card and using a rack display. And Shasta now encloses its tube in a heat-sealed cellophane envelope to prevent prying.

Another answer to the display problem may lie in Bradley Container's development of an oversized cap to serve as a base for the tube (displayed cap down). The label would then be printed "upside down."

Some complaints of flavor changes in tubed food products may be cased by newly announced coatings —which are sprayed on the interior surface of the container to cut oil and odor permeation and reduce oxygen and moisture-vapor transmission.

Another polyethylene package that has recently broken into the food field is the plastic squeeze bottle (Plax Corp., W. Hartford, Conn. and Bradley Container). Now used on a limited scale for honey (Sioux Honey Assn., Sioux City, Iowa) and for artificial sweeteners (E. R. Squibb & Sons, New York), this container shows real promise—both with and without internal linings—for dispensing a wide line of retail food products, such as syrups, toppings, ketchup, mustard, dressings, and food extracts and concentrates.

The bottles, in larger form, are also suitable for institutional and bulk food packing. Sizes run 3 cc. to 13½ gal.

Top fitments can be designed for any form of application—spray, drop, or stream—and caps can be made to add additional utility as measuring devices.

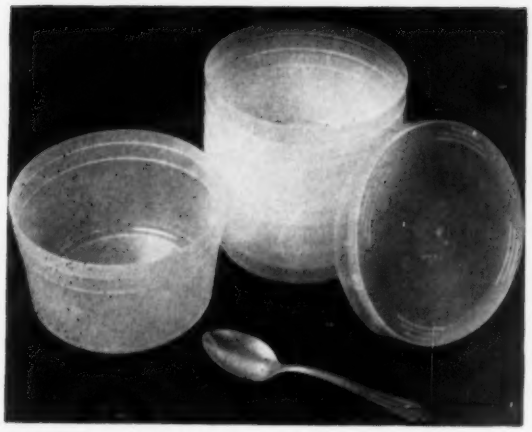
Squeeze Can

Closely akin to the above all-plastic container is another package that should be watched closely by food men. It is a squeeze can (Bradley Container) that has made a considerable impact in the insecticide field.

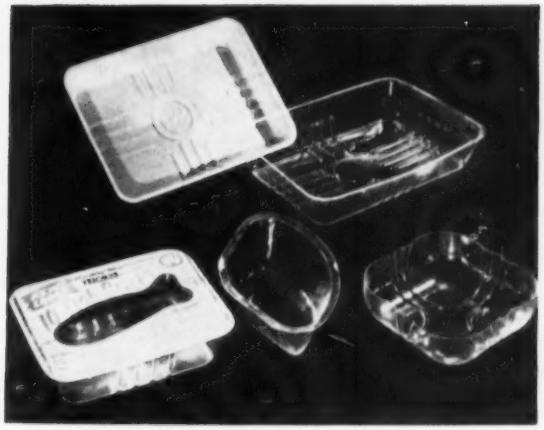
This can, comprising a polyethylene body and metal ends, can be adapted to nearly as many applications as the all-plastic bottle. In addition, the bottom cap can be fitted with a screw plug for re-fills, where re-use applications are important.

It can likewise be adapted to dispense products in either drop, spray, or stream form. Standard sizes hold from 8 to 32 oz.

Still another novel package that



HALF-GALLON CONTAINERS for ice cream are made from a new, tough polystyrene (Monsanto Chemical Co.). Tapered construction makes packages easy to separate for filling.



FROZEN-FOOD TRAYS, clear and translucent, are big innovation. Fishstick tray (lower left) has been successfully marketed. Wedge-pack for vending units (center) is under test.

may become important in the institutional field is a cubical container (Hedwin Corp., Baltimore) that is enclosed in a corrugated paperboard carton.

Reportedly competitive in price with conventional liquid carriers of the same volume—and much lighter—this container has a heat-sealed spout that is cut open for convenient pouring. It is available in 1-qt., 1-gal., and 5-gal. sizes.

For shipping and storing, the cartons are folded flat, and the cubes collapse and nest to take up little space.

Linear Polyethylene Opens New Fields

Versatile as polyethylene now is, its adaptability will be greatly increased with extensive production of the new linear or high-density forms (also known as polymethylenes, polyolefins, and low-pressure polyethylenes).

These materials have one property in common that make them of high interest to food men—they withstand temperatures of 250F. This fact opens up the entire range of heat-processed foods to thermoformed packaging.

In addition, the linear polethylenes have greater tensile strength and increased rigidity—permitting formed containers to be made with thinner walls, thus reducing shipping weight and package cost.

According to one large converter, linear polyethylene now costs from one-half to two-thirds more than standard polyethylene resin. But since containers made from the new product can be reduced in weight by at least one-half, these packages will probably go on the market at the same price as regular polyethylene ware.

One application already announced is a brand-new vacuum-formed tray for fresh or frozen poultry. It reportedly triples the shelf-life of this perishable product. International Latex Corp., Dover, Del., makes these trays for Ramsey Products, Suffolk, Va.

The flanged tray, measuring 5½x8x2¾ in., accommodates an average-sized cut-up fryer and, after filling, is fed through an automatic sealing machine where imprinted, roll-type polyethylene film (3-mil) is heat-sealed over the top.

Other experimental designs for sterilizable food containers made from linear polyethylene include round cups, "cans", tubes and bottles. Also under experiment is a machine that loads and seals blisters at 150-200 per min.

Primarily designed for acetate bubbles mounted on cards, this unit (Packaging Industries, Montclair, N. J.) is also projected for use with linear polythylene. So far, both candies and shelled eggs have been experimentally packed in blisters top-sealed with roll film.

The present machine will take packages of almost any practical size. And a new unit, now in the works, will actually form the blisters and feed them from rolls or strips to the fillers and sealers at up to 300 per min. At present, the company feels the package is commercially economical only where orders run to material weights of over 20,000 lb.

One property of polyethylene which can be either an advantage or a disadvantage, depending on the case, is lack of clarity. In the gages commonly used in semi-rigid and rigid packages, the material is cloudy.

Where clear "see through" is desired this is a drawback. But many products do not lend themselves to visibility. And polyethylene is obtainable in many bright colors that make an attractive package to suit these circumstances.

Also, cups, blisters, and trays can be closed with sheets of polyethylene film. And here the makers have done a very good job in developing films with a clarity rivaling, in some instances, that of cellophane.

Styrenes—Versatile Materials

Now to the styrenes: These are available in a wide range of colors—including crystal clear. They are cheap, light, and relatively easy to form by injection molding. Some can withstand temperatures up to 234F.

Recent developments in modified styrenes (high impact) and in injection molding equipment permit manufacture of containers having wall thicknesses under 0.020 in. These are said to be competitive in cost to disposable, treated paper cups—and indeed have been used as cups in drink-vending machines.

Principle applications, to date,

This is what the housewife sees . . .
Which one is truly instant . . . ?

These are photos of actual samples of differences of the instant-ability of commercial nonfat milk powders.

When it comes to processing instant milk there is truly a difference between solubility and dispersability. Consumers want flavorful powder that disperses readily and completely. Many nonfat milk powders dissolve instantly but lay as sludge on the bottom of the glass, others will never completely dissolve. Now, with the advanced Blaw-Knox Instantizer, you can produce a superior product that disperses instantly and completely with no settling out. (Photo at right)

Blaw-Knox research has proved that there is a delicate process balance required to obtain full flavor combined with dispersability. Dispersability is related to moisture pickup and after-drying time. Flavor is affected by time and temperature. Final flavor of an instantized product is affected by three things.

- **MOISTURE PICKUP**
  Held to less than 1% with the Blaw-Knox Instantizer.
- **TIME AND TEMPERATURE OF PRODUCT EXPOSURE**
  Only seconds at less than 120° F. with the Blaw-Knox Instantizer.
- **LENGTH OF AFTER-DRYING TIME**
  Less than one minute with the Blaw-Knox Instantizer.

A processor must also be aware of the durability characteristics of the instantized powder to assure a full package on the grocer's shelves. Powder processed with the Blaw-Knox Instantizer approaches the ultimate in holding the delicate relationship between temperature, moisture pickup, flavor retention, and powder durability.

Full size Instantizing equipment in the Blaw-Knox Laboratory is ready for a test run of your product. You are cordially invited to send us a small quantity of your powder and witness a trial run. No obligation, of course. You will see a very simple, uncomplicated machine, easy to maintain. The results will speak for themselves.

THE BLAW-KNOX INSTANTIZER

STAINLESS STEEL EQUIPMENT
FOR THE DAIRY INDUSTRY

- EVAPORATORS
- SPRAY DRYERS
- INSTANTIZERS
- AUXILIARIES

BLAW-KNOX COMPANY
DAIRY EQUIPMENT DIVISION
MORA, MINNESOTA

have been for ice cream, cheeses, and salad products. In this area, the large U. S. manufacturer, Mutual Plastic Mold Co., Southgate, Calif., has recently announced an average price cut of 6% on polystyrene containers, based on improved manufacturing techniques, increased volume, and some reductions in raw material prices.

If this trend continues, there will undoubtedly be an upsurge in styrene containers for refrigerated products, and in snap-in and full-cover closures for paperboard packages.

However, the newest—and most significant—development in polystyrenes is biaxial orientation, which permits these materials to be used in trays for frozen foods and produce (Polyflex by Plax Corp.). Also, there's progress on the problems of putting red meats in these containers.

Oriented polystyrene trays have been used for fishsticks. And a special, wedge-shaped container is now being marketed as a vending-machine pack for heat-and-eat items. The plastic reportedly withstands temperatures from −70 to 200F.

One big problem that had to be solved before these containers became commercially feasible was the closure. The fishstick tray uses an ingenious heat seal employing both a serrated edge on the lid and a bar flange on the container. A kick-press is currently used for sealing, but automatic equipment is in the development stage.

According to Plax, the tray and three-color lid run below 3c. in large quantities. This makes the item very competitive with lined paper (2.8c) and foil packages (3.0c.). The company is also working on coatings for Polyflex to further boost its product range.

Fine prospects are also predicted for polystyrene trays and baskets—overwrapped with a thin polystyrene film—for fresh produce. The material has high-sparkle sight appeal.

Cellulosics—New Form Wins FDA OK

Use of acetates in rigid food packages has been held up by two real problems: 1. A plasticizer is necessary to thermoform this material—and these compounds must be cleared by FDA. 2. Acetates have a high, moisture-vapor transmission.

The first problem has been solved, and a plasticized acetate that meets FDA regulations is now in actual commercial use. The second problem is controllable, to some extent, by use of a heavier gage of acetate sheet for the container, or by bundling the finished packages in a barrier material (like cellophane) for storage and shipment.

However, acetate will probably not be used for certain products that are particularly sensitive to moisture gains or losses.

Initial use of the new acetate is a portion-controlled jam and jelly pack, marketed by Prime Pak, Los Angeles. These cups converted by California Mechanical Products, Los Angeles) are decorative, hold a one-serving portion of product, and are closed with a paper plug-cap. The acetate cup has sparkling visibility.

A similar portion-pack, marketed by Kraft Foods, employs a cubical package made from calendered vinyl, with a heat-sealed film top.

This latter material is hailed by the maker (Bakelite Co.) as excellent for packaging red meats, poultry, and seafood. It is dimensionally stable, and has high resistance to greases, oils, and water absorption. But it is not particularly clear.

Acetate for Windows, Lids

To return to acetate, another interesting use is for windows and lids for metal cans. In one example, a 10-15 gage window is sealed right in the can lid. In another case, the acetate forms a snap-on cover for the can. Both containers (American Can Co.) are used for refrigerated products.

Because the cellulosics are known for their wide color range, mechanical strength, toughness, and in some cases, excellent low-temperature properties—there is no doubt that they will find increased use in the course of new developments.

Progress in Other Plastics

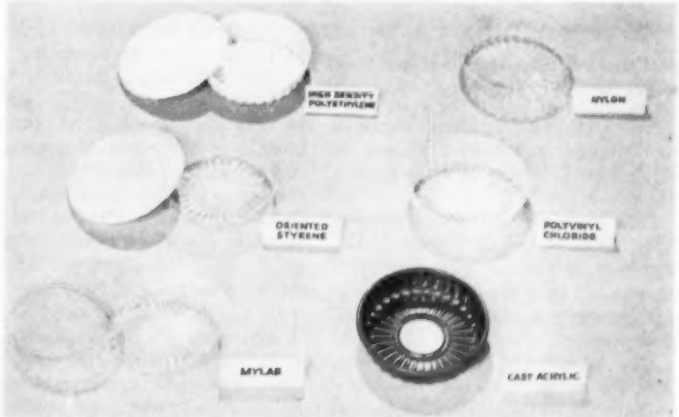
While the foregoing materials are the main plastics now being seriously considered for the semi-rigid and rigid packaging of foods, processors should keep their eyes on experimental work that promises new packaging advantages. Here's a case in point:

Recently, the Auto-Vac Co., Bridgeport, Conn., announced its success in molding containers and closures from a wide range of plastics hitherto not considered suitable for this application.

Among the materials used were Mylar, Mylar laminates, polyvinyl chloride, cast acrylics, nylon, and extruded vinyl.

The company says that the equipment employed in this feat not only represents a distinct departure from conventional vacuum forming machines, but operates 200-300% faster than ordinary vacuum or drape forming equipment.

With this kind of stepped-up research in all forms of plastic packaging, the food man can look for an ever-widening choice of shapes and materials to solve his problems and fill tomorrow's complex packaging demands. —*End*



VARIETY of plastic materials have now been molded successfully (by Auto-Vac) in many colors, as well as crystal clear. Varying properties of the plastics promise food men a wide choice.

HIGHLY ENTHUSIASTIC about the new package is Dannon's tireless president Joe Metzger, shown here displaying the yogurt line to a prospective distributor. Since its adoption four years ago, sales have doubled, thus recently necessitating opening of a new plant in Philadelphia.

Switch to Paper Cups

When high delivery costs and resistance to returnables stymied sales, Dannon adopted round, nesting, paper containers—now using them 100%.

J. D. SANDERSON

Field Research Division, Paper Cup & Container Institute, New York.

THE CONNECTION between a new package and a sudden jump in sales is an old story to food processors.

But probably few manufacturers have gone as far as Dannon Milk Products, which actually redesigned its product in order to use the package the company felt would be most successful.

The experiment paid off. By concentrating on a single product—yogurt—in a single regional area, and by shifting to colorful paper containers with a greater advertising impact, Dannon in four years almost doubled its sales volume.

Today is sells more than 15 million packages a year, accounts for 77% of the total yogurt marketed in its area, and is aggressively expanding beyond the seven states centered around its New York City plant.

But growth has not been easy for Dannon. Except for a few health-food enthusiasts, the product was virtually unknown to the American public in 1942 when Joe Metzger set up operations in New York City with a staff of six persons.

The first year the company sold only 200,000 units. Normal difficulty in introducing a novel food was heightened by the perishable nature of the product. And high shipping costs cut deep into profit.

Metzger found that, for sales outside the local delivery area, he had to pay freight on 8 oz. of glass to deliver 8 oz. of yogurt. Since the jars had to be returned, protected by 4-oz. wood containers, it cost 2 lb. of freight to make a single sale. If yogurt could be packed in non-returnable containers, he decided, this extra burden would be entirely eliminated.

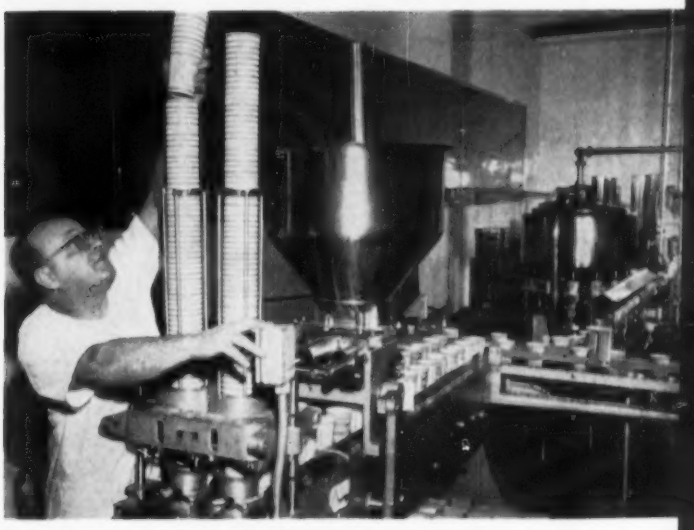
Dannon salesmen during the next few years led Metzger's thinking in the same direction. Retail outlets, while usually willing to try yogurt on their customers, disliked the idea of another bottle-deposit product. And, as self-service grew in the grocery field, dealer resistance mounted.

Obviously an economical single-use container was called for. But yogurt, as then produced, could not be packaged in paper. The trouble lay in the manufacturing step which gives Dannon's product its unique character.

Fitting Product to Package

The bacteria cultures used have to be added to the milk while it is

PACKAGES are printed in brilliant color combinations, with striking lid designs.



IN FILLING OPERATION, cups are dispensed onto conveyor lines, get injections of preserves from filler (foreground), are filled with inoculated milk (rear).

Gives Yogurt Big Boost

still warm following pasteurization. Then the milk is filled into retail packages, which are, in turn, moved to warm incubation chambers where fermentation is induced. All of this heat, however, reacted on the coatings of the paper containers.

The company set out to change the product's biological structure to fit the containers. After years of methodical search, the research staff discovered a way to alter the symbiosis of the culture so that whole procedure could be carried out at a lower temperature.

Round nesting 8-oz. containers thus were introduced, and within two years, sales shot up to 30,000 units a day.

Because the packages are usually displayed with only the tops showing in retail cold cabinets, great stress was laid on a striking lid design (in gold and a second color).

The company uses its colorful packages to drive home sales points, such as the fact that some yogurts now contain 50% less butterfat than ordinary milk for a total of only 120 calories per container. Also suggested are ways of serving the food, and a side panel offers a free book.

In 1947, realizing that the American public is inclined toward a sweeter taste than Europeans, a high quality strawberry preserve was added to some containers, to be stirred into the product by the consumer.

Sweet "dessert" yogurt caught on slowly, but by 1952 had grown so popular that an orange flavored product, made by incorporating sweetened orange concentrated to

How Yogurt Is Made

Milk is brought in tank trucks from upstate New York and pumped through stainless pipes to the processing room. Here, it is put through a DeLaval clarifier, pre-heated, homogenized, and short-time pasteurized at 185F. for 30 sec.

When the culture, produced in a laboratory adjoining the processing room, has been added, the warm milk continues to a battery of four fillers.

The paper containers are fed onto conveyor lines and move under injectors that meter preserves into them when desired. Then they are filled with inoculated milk, capped, and the lids coded so that any package in a store more than two weeks can be replaced by a driver-salesman.

Filled containers are packed by the dozen into the light die-cut kraft trays in which they will ultimately be delivered. These trays are placed on hand carts, carrying 34 trays each, which are wheeled into the incubator room.

After about 3 hr., the fermentation process has been completed. Then the carts move in a direct line to an adjoining refrigerating room, and the next morning to the loading platform.

Jarring and shaking do not hurt yogurt's quality but do affect its appearance. So Dannon makes every effort to deliver its product to the housewife as a smooth, custard-like substance.

Whenever possible, the trucks at the loading platform make deliveries directly to stores and institutions, ranging from the Long Island City plant sometimes as far north as Massachusetts and as far as south Delaware.

This AIR-COOLED CONDENSER produces a Higher Vacuum

● Using air as the cooling medium, the Niagara *Aero* Vapor Condenser produces a higher vacuum than other type condensers, and with more economy of power and steam.

It sustains its full capacity in cooling or condensing with no more than a nominal cooling water requirement, eliminating entirely your problems of water supply and disposal.

It holds constant the liquid or vapor temperature producing always uniform products and giving maximum production.

Non-condensibles are effectively separated at the condensate outlet, with sub-cooling, after separation for higher vacuum pump efficiency.

Niagara *Aero* Vapor Condenser can be mounted directly on the steel structure of your evaporator or distillation column. Its operation is dependable; its maintenance is not troublesome or expensive.

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the milk before fermentation, was introduced. The following year came vanilla, made with natural extract and sugar. In 1955, prune whip was added by the pressure method. And to mark its 15th anniversary the company has just introduced pineapple.

Metzger, however, has not written the success story with packaging and merchandising alone. "We have a good product," he says, "and we make a considerable effort to see that no customer ever has a chance to say otherwise."

This understates his case. Although dairies generally are exceptionally aware of the need for cleanliness in their production, Dannon guards the integrity of its bacterial culture with all the care of a pharmaceutical laboratory.

Processing takes place in a 5,000-sq. ft. room where air is completely changed every 8 min. in winter and every 4 min. in summer. The company developed its own purifier, which filters the fresh air through glass wool, washes it, and filters it again. The room itself is pressurized at 15 lb. above the outside atmosphere so that air rushes out when doors are opened, preventing untreated air from entering.

To make doubly sure that unwanted bacteria are not brought into the plant, the company driver-salesmen have complete facilities, including payroll windows, outside the processing area.

All this careful attention to sanitation has significantly lengthened the period of time in which the yogurt can be kept in stores and home refrigerators. —*End*

"Yep, a lot of 'em are now spray-resistant—so our realistic engineers rushed right into production with this Positive-Combination number."

How to capture and hold natural fruit colors at their peak...*and keep them from "fading"*

Easy low cost way to give your brand that "fresh-picked" look —the kind Mrs. Consumer buys again and again and again

It's disheartening, isn't it? Disheartening to have those bright, mouth-watering colors of your highest grades—so eye-appealing when they were packed—become discolored by the time Mrs. Housewife serves them. And it's so unnecessary, too, thanks to Staley's Sweetose Enzyme Converted Corn Syrup.

For Sweetose holds maximum color . . . gives better gloss . . . retains the "sheen" that says *your product* was fresh picked. That's because Sweetose better protects the "natural pigments" in your red fruits . . . retards the oxidation of Vitamin C that causes "browning" . . . contributes other appetizing appearance factors as well.

Get *all* the facts. Learn how Sweetose and Staley's bulk handling system not only speeds production, cuts costs—improves flavor, body, quality—*but* steps up your sales by holding natural fruit colors. See your Staley Representative or write, wire or phone today.

A. E. Staley Mfg. Co., Decatur, Ill.

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For more data, circle this page number on card at back →

Creating The Package

With Kaiser's new can-production techniques trimming the cost margin, cheesemaker takes big step of pioneering the lighter containers . . . No. 1 is shaker-top item for grated goods

Kraft Cheeses

TOMORROW'S tinless food can—initially a round, shaker-top container with three punch-out perforations, swivel disk-seal and rolled-seam closure for grated cheese products—will appear on the nation's grocery shelves in early '58.

The can is now in production after about 3 years of research by Kaiser Aluminum & Chemical Corp. And it'll be first used by Kraft Foods Division of National Dairy Products Co. for American and Parmesan grated cheese.

Kraft feels that the new can is a major contribution to food-industry progress, and terms its use another company first in providing better packages and products for buyers.

Main reason it is putting its grated cheese into aluminum is because the seamless can more effectively maintains the desirable moisture content in the cheese. Rolled-on top seam is so tight that it's "almost a cold weld." Moisture pick-ups, which make the product lumpy and difficult to sprinkle, are reduced.

There are other reasons why the new can is ideal for grated cheeses: It has a striking, shiny eye-appeal. And the company anticipates this will go far in promoting sales. Specifically, the bright item is seen winning impulse buyers in the large self-service markets.

The new can should also be popular with the housewife as an attractive addition to the dinner table.

New Parmesan grated cheese cans are being fabricated in two heights—3 $\frac{7}{16}$ in. for the 1 $\frac{1}{2}$-oz. size and 5 $\frac{1}{16}$ in. for the 3-oz. American grated cheese will be put up in 3 $\frac{7}{16}$-in. cans. Wall thickness will be 0.009 in.

Body of the Parmesan grated cheese cans will be 3-color printed—red, white, and green. American grated cheese cans will be printed with red, white, blue, and yellow. Both type cans, however, will have a silver aluminum background in the non-printed areas. Bodies will be overcoated with a vinyl-type resin.

Initially, inks will be imported from Switzerland. But it's expected that American ink makers will soon take over. Cans are color-printed after forming, with the aluminum employed as a base coat.

The new cans are to replace Kraft's present composite container, which consists of a paperboard cylindrical body with tinplate bottom and shaker-type metal top. This container's body is coated with a thin, color-printed foil label.

Kraft, of course, is investigating possible application of aluminum cans to other food products. Meanwhile, various other food companies are actively interested in using aluminum cans. And can manufacturers are curious, too. One of the large breweries has even made inquiries.

Fabricating Details

The lightweight Kraft-cheese can will be produced in one piece, with seamless can body and bottom by a new deep drawing and ironing tech-

MULTI-COLORED cans should lure impulse buyers like magnets. Attractive enough for table use, they follow trend set by Morton "Salters." Shaker top (above) permits easy pouring. Tight seal prevents lumping of cheese.

ONE-PUNCH shallow-drawn cans offer a wide range of potential uses for the food man.

Make Debut in Aluminum Cans

nique, proved out by Kaiser's can-development group. The latter process is applied to circular aluminum disks by a 5-die can-making press at the rate of about 100 per min.

Can bodies are then transferred to another machine for trimming and flanging. Shaker-top covers are separately stamped out.

Production equipment has been installed in commercial prototype facilities at Kaiser's Wanatah, Ind., plant. And the company is searching for improved methods that will step up production.

The Re-Use Appeal

Some cans may be designed with reusable features. Long drawn cans are conceivably foreseen as reusable in the form of beer tumblers or cocktail shakers. The shallow drawn can, with its replaceable lid, also has re-use potentials. But it doesn't look likely that the shaker-top cheese can will lend itself to such function because of the difficulty of top-refilling through the three small holes.

Aluminum cans have not, as yet, been commercially run through filling lines. And there may be some question of using them on gravity-feed lines. However, Kaiser believes that processors will easily solve this.

Heretofore, deep drawing of aluminum can bodies was a costly and much slower operation involving a battery of five die-press machines.

Kaiser expects to produce aluminum containers in a wide range of sizes and shapes. Sizes could range from capsule form to large industrial tanks.

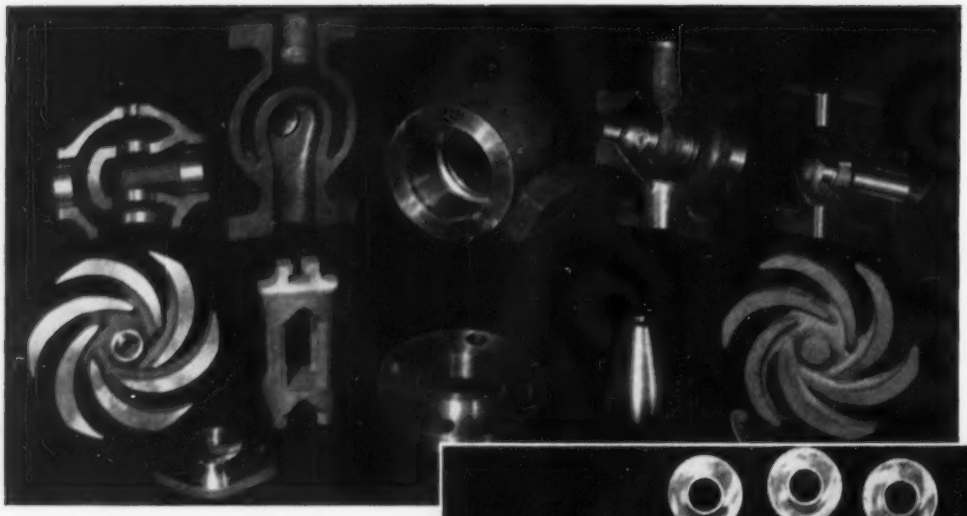
The company is now producing a one-punch shallow-drawn can for military non-food use (bearings in oil). And such containers should ultimately find a wide range of potential applications for food products. These are produced by one machine that stamps disks into can bodies that are trimmed and flanged. This action is single stroke.

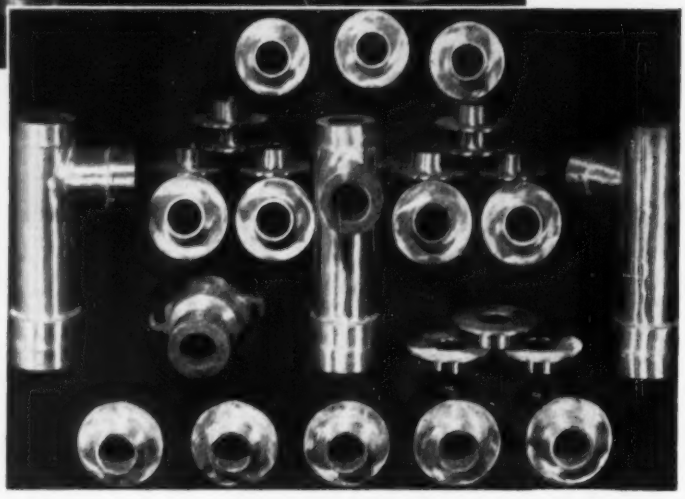
Notable is the fact that aluminum containers can now be drawn—by single stroke—to give a length 4½ times that of the diameter of the can.

Extrusion Disadvantages

Kaiser is experimenting with the can-extrusion process, but it is presently "sold" on the deep-draw technique. Extrusion does not produce as glossy a surface, and extra can washing is necessary—particularly since lubricating oil on the press is often ground into the container.

Further, extruding often results in extra-thick bottoms—thus wasting metal. Unlike drawing, extruding also limits use of very thin body





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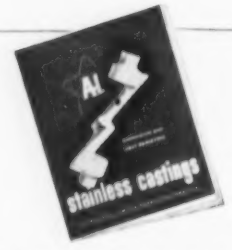

Write for this book on A-L STAINLESS STEEL CASTINGS

28 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

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Every stainless casting produced by our Buffalo Foundry carries the familiar A-L Star trademark, cast into the steel. That means it's Allegheny Ludlum *time-tested* stainless steel—a pioneer that has successfully answered thousands of difficult corrosion and heat resisting problems.

It not only means experience in stainless casting applications, but in maintained high quality, too. The A-L Buffalo Foundry is a pioneer in both the vertical-centrifugal and static methods of casting stainless steel. You can depend upon Allegheny stainless castings to be strong, clean-surfaced, sound-structured and easy-machining . . . fully in accord with the service conditions and with your requirements for delivery.

Let our stainless foundry specialists quote on *your* casting needs—any size, up to thousands of pounds—regular production quantities or problem jobs. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

WSW 6535

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Allegheny Stainless

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Warehouse stocks carried by all Ryerson steel plants

walls. The manufacturer also dislikes the fabrication and composition of extruded can walls and ends, because side and bottom seams detract from appearance.

It appears that aluminum beer cans might have to be drawn, since the containers' side seams are not likely to withstand internal CO_2-gas pressure.

Kraft's use of the new can is an important step in aluminum's bid for a major part of the expanding food-can market. And Kaiser's success in applying the deep-draw process to mass production foreshadow's a growing use.

By employing this method and taking advantage of aluminum's unique characteristics, Kaiser is able to produce an attractive can that's highly protective, extremely light in weight (¼ the weight of a tin can), easily opened, easier to seal, and which can be adapted to special shapes and sizes.

Although unit costs of aluminum cans may, in some instances, be initially higher than tinplate cans, Kaiser doesn't feel that this will hinder their widespread applications in food packaging.

What's more, any slightly higher cost should be offset by added appeal, increased sales, and shipping-weight savings.

Kaiser Supplies Cans

Aluminum-can-making machines will not be presently integrated with food-plant filling lines. Can bodies and covers will be shipped to Kraft, where they'll be fed to filling and closing machines.

Kaiser believes that a food company would have to use 20 to 25 million cans annually before it could find it profitable to install its own can-making equipment. And this, of course, would be impossible for small food firms.

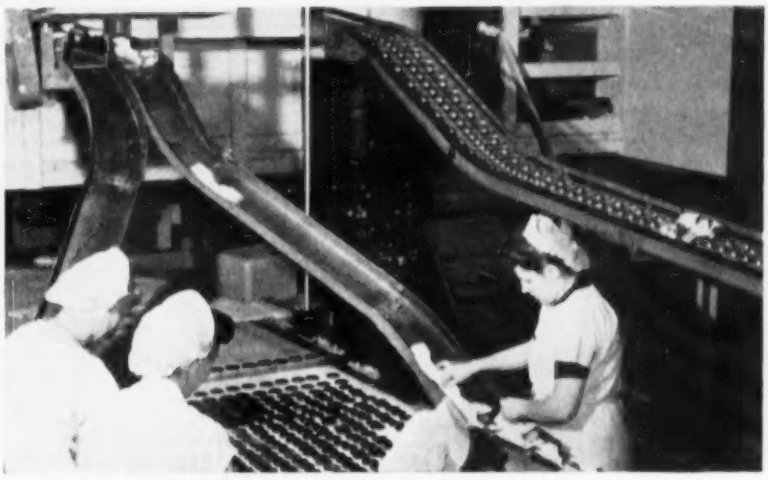
Kaiser's main objective is to sell aluminum. It would be interested in selling the process to food companies and can manufacturers eventually.

Plans No Reclamation

Presently, no attempts will be made to reclaim used aluminum food cans. But it was pointed out that can maker, canner, retailer, etc., may soon recognize the value of used cans and suggest their return through scrap-reclamation drives.

—*End*

Ask Standard ... how to cut costs with conveyors



Chutes carry empty trays from makeup machine to packing belts alongside the cookie enrobing line.

Trays are filled with cookies as they move past operators to automatic wrapping and packaging.

Floor-to-floor conveyors save manhours, space, handling

for famous biscuit and cookie maker

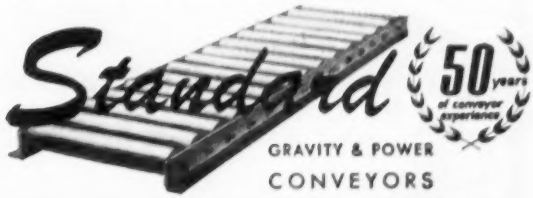
A VARIETY of conveyor equipment makes this system a model of simplicity, efficiency, economy.

It's another example how Standard's experience in conveyor application pays off. At Robert A. Johnston Company, Milwaukee, Wisconsin, Standard Conveyors pay for themselves in manhour savings . . . eliminate most hand trucking . . . cut floor area needed for handling by two-thirds.

STANDARD CONVEYOR COMPANY, General Office: North St. Paul 9 Minn. Sales and Service in Principal Cities. *Canada*: International Equipment Co., Ltd.

Left: 3-tier power and gravity system carries cases to warehouse. Tape-sealing and coding of cases are done on roller conveyor lines. Right: Multiple spiral chutes lower cased goods from 4th to 1st floor. Speed is controlled by pitch design.

For details, see the Standard Engineer listed in the phone book or write for Bulletin 309. Address Dept. D-11.



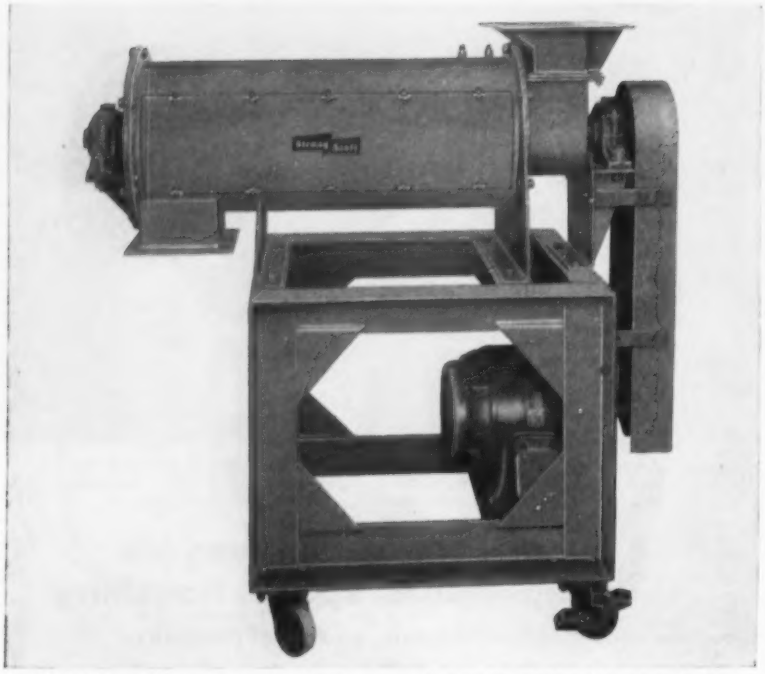
GRAVITY & POWER CONVEYORS

Sales and Service in Principal Cities.

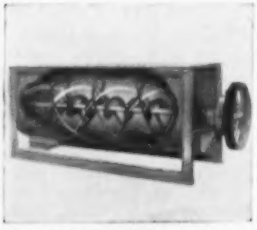
For more data, circle this page number on card at back →

NEW PRODUCT NEWS

NEW HIGH SPEED MIXER FOR QUALITY FINISHING

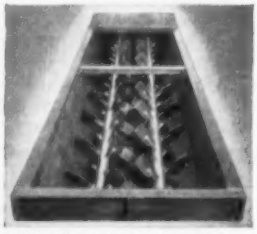


The Turbulizer produces a homogeneous mix, increases production while reducing mixing time and costs.



TRIPLE ACTION MIXER—Complete uniform blending in 2 to 7 minutes.

STRONG-SCOTT TRIPLE ACTION MIXER exposes each particle in the mixture to over 10,000 separate mixing actions per minute as it blends and folds. This produces a uniformly mixed product with 99.9% thorough distribution of minor additives.



TWIN ROTOR MIXERS—Accurate blending of liquids and dry mix at any speed.

TWIN ROTOR MIXERS are designed primarily for high percentages of liquid application to light weight ingredients, where product identity is to be maintained. A double shaft assembly with overlapping, adjustable paddles gently combine the liquids with the dry mix.

STRONG-SCOTT TURBULIZER

Provides Fast, Thorough Dispersion, Disintegration and Blending of Dry Materials, or Pastes Involving Liquids and Solids.

The TURBULIZER is a high speed, continuous mixer that will disintegrate and disperse fat pellets, chemical ingredients which have a tendency to ball or agglomerate, and other ingredients which can be broken by the paddles and thoroughly dispersed in the mixture. Product uniformity is accurately maintained as a result of high speed centrifugal forces created by the paddles.

It is also highly applicable where a fluffing action is desired on powdered material. Minor percentages of liquid may easily be added to dry mix with high efficiency and dispersion results.

The TURBULIZER is self cleaning and is built with sanitary seals at each end of the shaft. The interior is precision machined. Overlapping, adjustable paddles turn within a close tolerance to the chamber wall, providing a selective rate of material flow.

The TURBULIZER may be furnished in carbon or stainless steel and may be jacketed for hot water, steam or a refrigerant. Capacities will vary depending on the bulk density of the material and the degree of agglomerates encountered. Consult Strong-Scott for full details.

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Booths 1138 1142 and 1144

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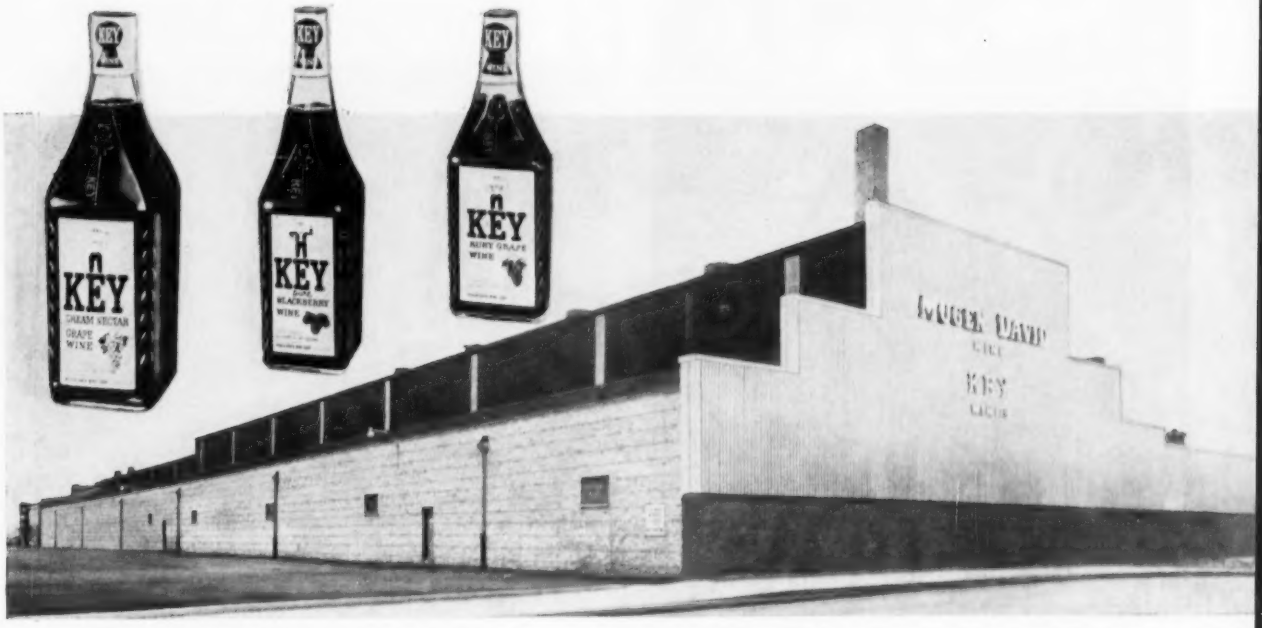


NEW SQUARE BOTTLES and $3½ million winery, plus vast know-how, have all contributed to outstanding acceptance of MD's new Key wines. Plant houses latest refrigeration, pasteurizing, and materials handling equipment, as well as huge redwood and stainless steel fermenting, storage, and blending tanks.

'Keys' Wines to U.S. Tastes

Company introduces three new ones based on American preferences and uses. Backs them up with ultra-modern winery and extensive promotion

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

MOGEN DAVID Wine Corp's. president, Henry Markus, is a firm believer in Daniel H. Burnham's statement:

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized."

This bold planner has already made two calculated risks that have paid off handsomely.

First was on Sept. 23, 1947, at 5:17 P. M., when he opened the drain cocks on all vats in his winery to let 40,000 gal. of wine flow into Chicago sewers.

No one challenged his right to burn all bridges behind him, since he was, at that time, vice-president. But many of his business associates sadly shook their heads when he announced his decision to not only dispose of the wine but, at the same time, kill off a brand name —"Barloma"—on which hundreds of thousands of dollars had been spent in promotion.

Why did he do it?

Because he dropped in on one retail outlet after another, in the Peoria and Rock Island areas, and discovered that the firm's then-new wine—Mogen David—was more highly recommended and accepted. Yet, not a cent was being spent on promoting it.

Back in Chicago, he analyzed sales records and found Barloma was just holding its own while Mogen David sales were moving up.

Second bold venture came about in January of '57, when the firm introduced its brand-new key wines—Cream Nectar, Blackberry, and Ruby. These were a logical outgrowth of its wine-making know-how and vast knowledge of wine usage and preferences of Americans.

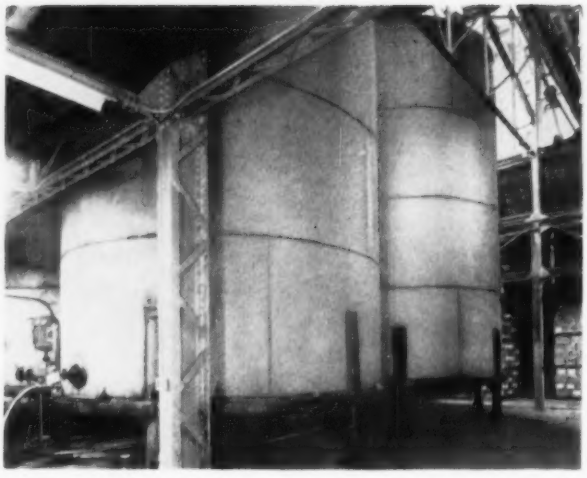
They are being promoted by a coast-to-coast network TV program supported by national and local radio, newspaper, billboard, and point-of-sale advertising.

To produce the new wines, a $3½ million plant was installed on a 6½-acre site at 37th and Kedzie, Chicago.

It houses the very latest refrigeration, pasteurizing, and materials handling equipment, and one of the world's largest stainless steel tanks, which is used for blending and storage.

Cooperage facilities have been enlarged by 2,500,000

REDWOOD fermentation tanks hold 43,000 gal. each, are specially mounted above pitched floor to facilitate emptying. Note covered drains (foreground).



FINAL BLENDING of wines is carried out in these 60,000-gal. stainless tanks.

gal. in California redwood, and by more than 750,000 gal. in stainless steel.

For the new plant, the company purchased an abandoned steel foundry and altered it, using the old foundation and footings, and part of the existing masonry structure. Practically the entire steel structure was rehabilitated and retained.

The plant now has an exterior of pleasing stainless steel, plastic panels, and brick. A large parking area with smooth, black-topped surface provides an unofficial playground for children of the neighborhood.

The spic-and-span winery provides new freedom for plant operations, and processes are streamlined for more efficient sequence. Raw materials come in one end and flow through fermenting, blending, refrigerating, storing, pasteurizing, and bottling to end up as palletized finished cased goods at the other end.

Modern freight-and truck-loading areas were set up to speed shipping and cut freight costs.

New Container, New Label

Introduction of the new wines called for a new container of contemporary design. So MD deputized its advertising agency to research the problem and create a suitable bottle.

The agency found that the typical round wine bottle wasted space when it was displayed on the dealers shelves and, unless properly aligned, lost its identity because the label was half-hidden.

To meet this problem, a square-shaped bottle was designed. It is reinforced to compensate for increased stress points, and edge-fluted to facilitate easy handling.

The long, narrow label area was particularly adaptable to a design incorporating the short "Key" brand name. So labels were designed to make maximum use of it.

Aside from quality of mechanical equipment, the firm believes in surplus of machines power rather than manpower. So it purchased 10 Hyster 2,000-lb. lift trucks, 25 Valley Foundry pumps, 4 VF plate-and-frame filters, 4 Chisholm-Ryder heat-exchangers, and other units for the dozen men running the winery.

MD considers it cheaper to shift a man between machines than to shift a machine from one job to another, paying for downtime on man and machine. Surplus of machines and cooperage also provides flexibility and adequate production facilities when business hits its peak.

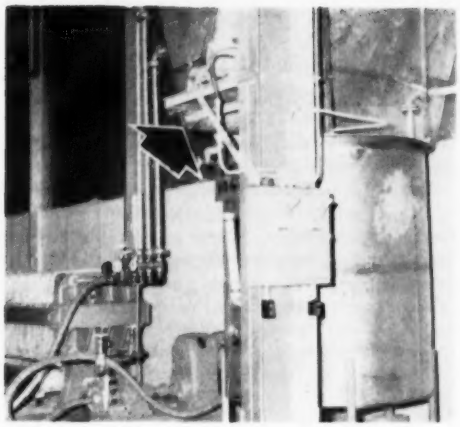
Used throughout are stainless steel pumps, fittings, and pipelines. And, as a further precaution against quality-damaging pickup of metals (iron and copper), machinery parts that contact the wines are of stainless steel.

Juice or concentrate is pumped directly from tank cars into ten 43,000- or six 23,000-gal. fermentation tanks (California redwood). During cold-weather, juice is heated by pumping it through an exchanger.

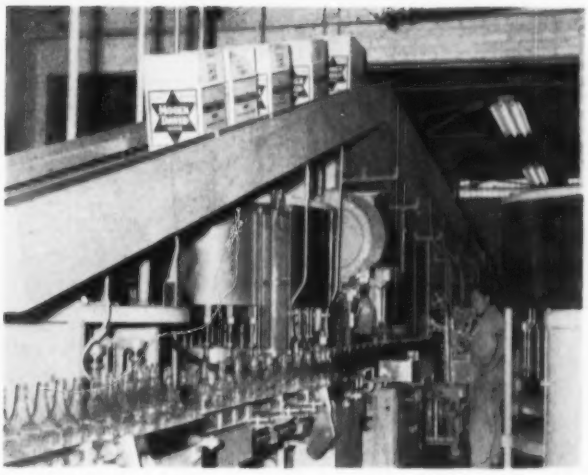
From the fermenters, wine is pumped through two 36-in., plate-and frame filters and into four 60,000 gal., stainless steel dish-bottom blending tanks. A portion of this wine is transferred to a below-floor-level stainless steel 5,000-gal. tank where the desired amount of sugar is added and blended with a motor-driven agitator. Wine-sugar batch is pumped to blending tanks, where it is mixed with wine, then, discharged to the 14 redwood storage tanks, each holding 43,000 gal.

Each filter press is serviced by a 1,550-gal. stainless pre-coat tank, with a vertical, propeller-type agitator (Lightnin). Filter aid is automatically proportioned into slurry tank by an 8-in. dia. screw, driven by a variable-speed motor. Rate of feeding is adjusted according to nature of wine being filtered.

Pumps, with 15-hp. variable-speed motors (U.S.), feed wine at rates up to 8,000 gpm. through a tubular,



PRECOAT for filter presses (one shown at rear) is prepared automatically. Screw (arrow) proportions filter aid from hopper above into slurry tank below according to requirement of specific wine to be filtered.



AT BOTTLING LINES, cases of empties are removed from pallets, with bottles going to unscramblers, air cleaners and fillers, and empty cases to overhead conveyor.

ammonia refrigerated heat-exchanger (Mojonnier) that cools it to 20F. Refrigeration is furnished by a 100-ton Frick compressor.

Cooled wine is discharged into eleven 22,000-gal. stainless tanks, located in a 22F. cold room. After sufficient time to precipitate tartrates and cold stabilize the wines, they are clarified by pumping through one of the previously-mentioned filter presses.

As needed, wine is pasteurized at 140F., then filtered through a 24-in. presses and discharged to four 5,000-gal. stainless steel bottling tanks. Dual units permit simultaneous pasteurizing of two types of wines.

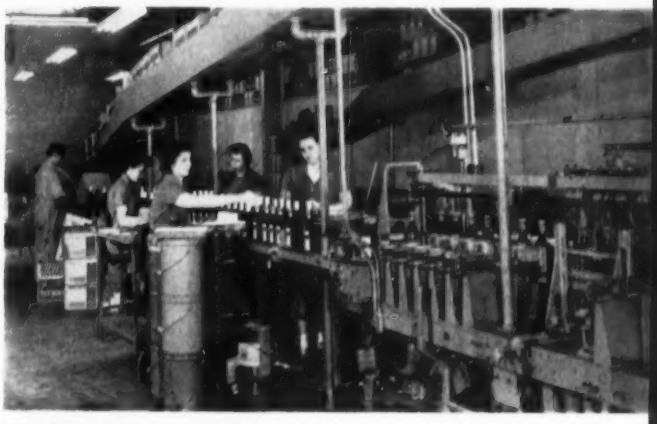
From bottling tanks, wine is pumped through still another pasteurizer and into two 700-gal. stainless surge tanks, equipped with floats that automatically control the pumps. Wines are now gravity-fed to two bottling lines, operating at speeds up to 125 bpm.

Advanced Packaging Line

Filling machines and machine parts are interchangeable for bottle sizes ranging from tenths to gallons. Fillers are adjacent to the storage area, and fork trucks move pallet loads of empties to, and fulls from the lines.

Cases of empties are removed from pallets, and fed onto a short portable conveyor. Bottles proceed to an unscrambler (Machinery Service), and empty cases are transferred to an overhead conveyor that travels to the casing station.

Bottles are automatically cleaned by a 7-nozzle air unit (U.S. Bottlers), then continue to a 30-spout US filler. Screw caps are automatically coded as they are continuously applied by a Resina unit. An Economic Beeline unit applies labels, then the line divides into two lanes for manual application of Celons and state tax stamps. Bottles are then manually cased before continuing to automatic ABC case sealers. —*End*



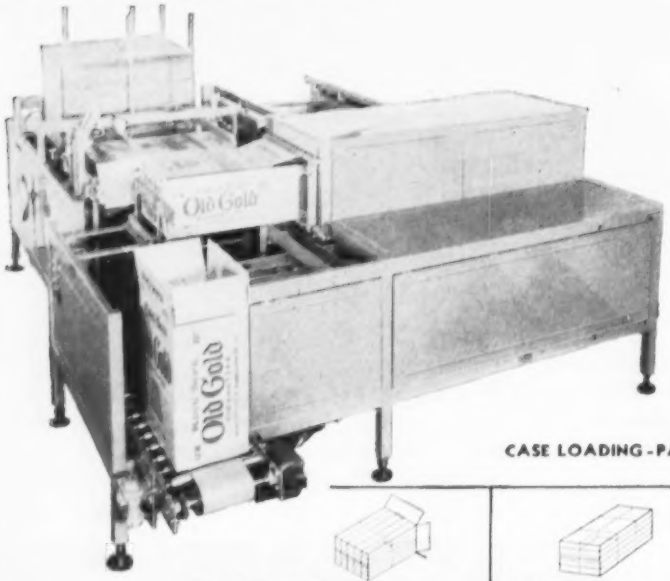
CAPPED BOTTLES go through labelers (foreground), then Celon bands and tax stamps are applied and the bottles cased manually.

STRIKING yellow and purple shipping container doubles as attractive point-of-sales display and theme element of company's TV show.

Which Packomatic solves your production line problem?

T.M. Reg. U. S. Pat. Off.

PACKOMATIC Feeder-Former-Positioner-Loader-Upender



Require a fully automatic case loader?

Here's a fully automatic case Feeder-Former-Positioner-Loader that is breaking records on actual production line conditions in a variety of industries. And by end-loading techniques, savings on paper board alone run as high as 28%. Production jumps dramatically with this high-speed, continuous-motion machine. Labor costs are lower, too, because except for hand-stacking corrugated shipping containers in flat form into the magazine, everything's automatic. Below are some of the end-loading patterns showing number and packing of cartons. Check with Packomatic engineers if your loading pattern does not appear here. Custom-engineering will produce a Packomatic for your product.

CASE LOADING-PATTERNS:

Twenty-four cartons in 12½" x 10⅝" x 8½" case

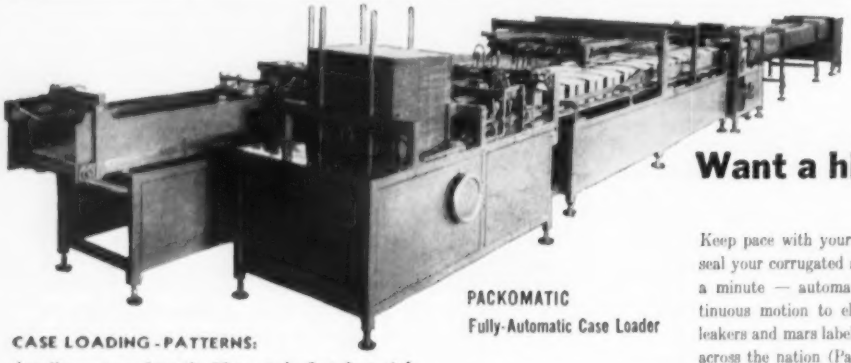
Eighteen 7 & 8 oz. cartons in 20" x 14⅛" x 8⅝" case

Sixty cigarette cartons
King Size: 17⅞" x 11½" x 22"
Regular: 14-13/16" x 11½" x 22"

Thirty 1 lb. cartons in 16⅛" x 10⅜" x 7¼" case

Twenty-four cartons in 19½" x 10⅞" x 7" case

Forty-eight cartons in 22¾" x 23½" x 15⅞" case



PACKOMATIC
Fully-Automatic Case Loader

Want a high speed can line?

Keep pace with your production line. Now, feed-form-position-load and seal your corrugated shipping containers at high-speeds — up to 720 cans a minute — automatically. This is accomplished with a smooth continuous motion to eliminate jarring and bumping of cans that causes leakers and mars labels or lithographing. Machines in successful operation across the nation (Packomatic was **first** with a successful production-line machine) end-load a variety of can sizes — from six 5-quart cans to twenty-four 12-oz. cans — in such patterns shown at left. End-loading reduces paper board costs. Automation saves labor costs. From corrugated flats to sealed containers, only one part-time attendant is required. Consider this time-money saver for your plant. We can custom-engineer a machine like this for you.

CASE LOADING-PATTERNS:

handles any can from the 12 oz. to the 5-qt. Imperial

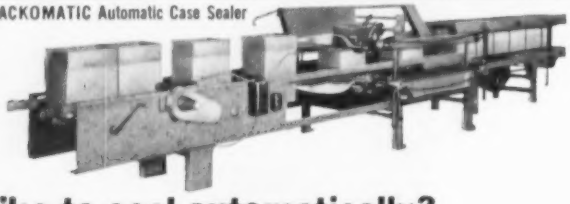
Six 5-qt. cans or gallon cans in 20 ⅛" x 13⅜" x 9 13/16" case and 20 ¼" x 13¾" x 8¼" case.

Twelve 46 oz. cans in 21" x 13" x 7⅛" case

Twenty four 12 oz. cans in 16⅛" x 10 1⅛" x 5⅛" case

Six No. 10 cans in 22 1/16" x 17⅜" x 7⅛" case

PACKOMATIC Automatic Case Sealer



Like to seal automatically?

Here's the machine for you — the **first** fully automatic case sealer proven under actual production line conditions. No operator needed to align corrugated cases, open flaps, glue, seal and discharge ready for shipment. Adjustable to a wide range of case sizes. Similar models, available semi-automatic.

PACKOMATIC 4-Side Case Imprinter with serial numbering device.

Need 4-Side Imprinting

Prints either or both sides and ends of corrugated shipping containers with name and contents — in addition to imprinting a serial number. Very essential if using modern palletizing methods. The only machine of its kind. Other regular models available for minimum case imprinting requirements. Write for specs and prices.

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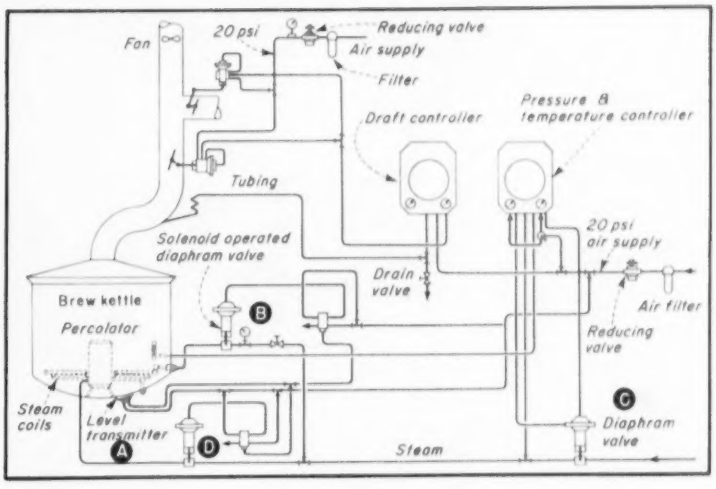
NEW YORK, CHICAGO, CLEVELAND, BOSTON, TAMPA, BALTIMORE, PORTLAND, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE, NEW ORLEANS, LOUISVILLE, KANSAS CITY AND ALL PRINCIPAL CANADIAN CITIES.

Focus on Control Actions

Coils must be covered by the entering wort before liquid-level transmitter (A) admits steam through solenoid-operated valve (B). Temperature controller then throttles main steam valve (C) to hold batch at just below boiling. When percolator is covered, steam flow is diverted through valve (D). Next, wort is brought to vigorous boil, with pressure controller throttling main steam valve. Draft controller positions dampers in vapor pipe to regulate boiling for uniform evaporation.



3-Way Kettle Control

Guards Product Uniformity

Latest in-stream monitors curb burn-on, give precision heat-processing and uniform evaporation

L. TRAUBERMAN
Associate Editor, "Food Engineering"

HOW PROTECT that prime marketing asset—uniformity of products?

True, rigid lab checks, from raw materials to finished goods, are primary.

But alert processors have gone a step further—by putting continuous-automatic control of unit operations right on the production line, where it's most effective.

Thus, complex process variables are being regulated by swift-acting instrument systems whose accuracy and dependability are far beyond the capacity of any human operator.

How such in-stream control is efficiently applied in modern heat transfer processing may be seen in the precision boiling of wort at American Brewery, Inc., Baltimore.

This single operation has three objectives, all vital to quality and uniformity of the final brew: Precipitation of unwanted proteins, optimum extraction of hops, and density control through evaporation. These actions, in turn, require careful regulation of three process factors—

1. **Wort temperature**
2. **Boiling action (kettle roll)**
3. **Evaporation rate**

Problem and Solution

In operation, wort and sparge water at about 165F. stream into the brew kettle over a period of time. For efficient protein precipitation, however, product must be raised to 210F. and held at that temperature regardless of inflow of cooler liquid. Subsequently, proper extraction of hops and evaporation of wort require just the right type of vigorous boiling.

Such precise control precludes use of manually operated valves, so American turned to the automatic system diagrammed above. Employed are panel-mounted recording controllers of wort temperature, steam pressure, and kettle draft (Taylor Instrument Cos., Rochester, N. Y.).

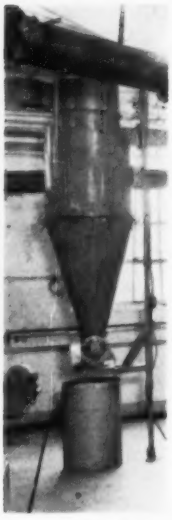
This triple-action system first prevents burn-on while kettle is filled by admitting steam to the coil on a liquid-level basis. Simultaneously, the temperature controller throttles the steam valve to hold desired temperature.

Pressure control takes over when liquid in the kettle covers the percolator. Steam is then switched from coil to percolator, and batch is quickly brought to a constant rolling boil, the steam valve now being throttled by the pressure controller.

Desired rate of evaporation is maintained by the draft controller. It measures pressure in the kettle's vapor pipe and positions dampers in the stack to hold a slight vacuum. The resulting air stream across the liquid surface promotes uniform evaporation.

Other Process Controls

The whole concept of in-stream control is similarly applied in mashing and sparging, where steam to both the mash cooker and mixer is regulated by electrically operated valves. Also controlled: Automatic batching and metering of temperature-regulated process water.—*End*



How versatile new pilot plant

Pioneers Advanced

It's done with latest production-scale units—specifically targeting more efficient comminuting, size-separation, and mixing. Here are eight examples typical of these modern handling techniques

FE STAFF

YOU'RE SITTING PRETTY when, without obligation, you can have your production problems researched in a supplier's pilot plant. And particularly so when such a testing setup precisely duplicates your own unit operations.

That's the service to food processors recently instituted by Strong Scott Mfg. Co., Minneapolis. And it's already performed handsomely in development of new products and more efficient processes.

It all started when this company set out to prove the adaptability of its advanced milling equipment in various branches of the food industry. Established was a working laboratory with production-size machinery to duplicate three commercial unit operations—comminution, size-separation, and blending.

Specially designed for flexibility, the new lab permits the conducting of unit operations either singly or in combination, batch or continuous.

Just how effective this processing research has been may be seen in the following practical solutions to eight typical production problems:

What's Been Accomplished

1. Problem: To produce a chocolate milk powder free of agglomerates.

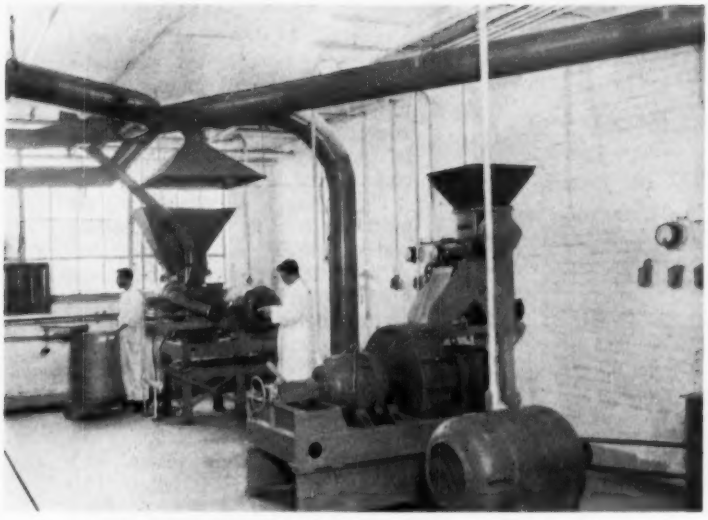
Process called for thorough blending of small amounts of salt, flavoring, and other ingredients to uniformly coat each particle of a batch containing cocoa and sugar. And this had to be done in sanitary equipment.

Solution: A brand-new process for introducing small amounts of flavoring solution to a 2,000-lb. batch in 3 min.

A spray system was installed in a jacketed, triple-action mixer (67-cu. ft. capacity). In operation, solids are brush-sifted into the mixer, and product temperature is controlled by an integral thermometer that automatically regulates water flow through jacket. Mixer's triple-blending feature further checks agglomeration to give over 99.9% distribution of minor additives.

This triple-mixing action consists of blending, folding, and agitation provided by an oscillating shaft with center spiral and two conveyor ribbons rotating at 24 rpm. The spiral breaks the core of the batch and tumbles it to eliminate buildup at either end of mixer, also carries the mix to outer fixed ribbons conveying ingredients in opposite directions.

Contamination of the stainless-



ADVANCED PRODUCTION-TESTING facilities include commercial-size mixers (left photo), also size-reduction and separation equipment (above). Units duplicate actual plant-operating conditions.

Processing

steel unit is abolished by sanitary seals, outboard bearings, and internal surfaces that are finished to eliminate cracks and crevices.

Still the problem wasn't licked. Cocoa powder contains pellets (over size hard particles) that must be reduced in size before the chocolate milk powder becomes easily and uniformly reconstituted.

The difficulty was overcome by eliminating use of an attrition mill, which required three or four passes. Instead, the batch is now handled at 5,000 lb. per hr. in a Turbulizer —a continuous mixer equipped with 10-hp. motor and 2,200-rpm. central paddle-mounted shaft.

This unit's self-cleaning interior chamber is precision-machined and its overlapping, adjustable paddles turn within ☆ in. of the chamber wall. Product flow is controlled by manually adjusting angle of the paddles, whose high-speed centrifugal action breaks up the pellets to maintain uniformity.

Doors are wing-nut secured and easily opened to facilitate cleaning.

2. **Problem:** A more efficient processing method for smoking of yeast.

Former small-batch method was time-consuming. It required piping smoke into a barrel of yeast, then tumbling for about 4 hr.

Solution: Freshly generated smoke is now piped into an airtight triple-action mixer. Gentle folding action of 24-rpm. mixer produces 1,000 lb. every 10 min.

3. **Problem:** A better way of preparing pickle relish from a vegetable mix containing mustard, vinegar, and brine.

The old manual mixing of a 500-lb. batch in a wooden barrel took 15 min.

Solution: Barrel handling is now abolished through use of a triple-action mixer that turns out a 5,000-lb. batch every 5 min.

Cut vegetables are gently blended, without mashing, for about 2 min. Then liquid ingredients are introduced while continued mixing prevents separation.

4. **Problem.** Breaking up shortening agglomerates during processing of cake, and similar mixes, to assure a uniform blend.

Trouble was in spraying warm, melted shortening into a batch. This shortening was soaked up, preventing its thorough distribution.

Solution: Two notable benefits were attained by running the batch through a Turbulizer: (1) Uniform blending of shortening free of agglomerates, and (2) reduction in amount of shortening required.

It's important to keep the temperature of the mix entering the unit at above 85F. This machine handles up to 10,000 lb. per hr.

5. **Problem:** Uniform color development and thorough blending of flavors in manufacture of gelatin and starch-type pudding desserts.

Solution: It was achieved by the Turbulizer's shearing action, which disintegrates the coloring to eliminate spots. Amount of coloring added is also reduced.

This method might also be used to alter the shade of cocoa powders by varying their mixing times.

6. **Problem:** Process for producing some 600 lb. of bread crumbs (5-6% moisture) per hr. from 900 lb. of bread (37% moisture).

Solution: A gas-fired heater was set up to discharge air at 600-700 F. into a Unit Pulverizer—a high-capacity, heavy-duty air-attrition-type pulverizing mill. Latter has a 2,000-cfm. cyclone collector with a rotary air-lock valve to discharge bread crumbs into bagging equipment.

This high-velocity air-current system comprises a pulverizer, classifier, drive motor, and exhauster. In operation, bread enters the pulverizing chamber by adjustable reciprocating feeder, while level of bed under rotor is automatically maintained by hydraulic feeder. Foreign material accumulates at bottom of pulverizing chamber to provide clearance for rotor blades.

Rotor, with swinging blades revolving at 1,765 rpm., sets up a fan action that sweeps incoming bread over the bed and around an enclosure formed by the pulverizing chamber. Conveying air is drawn into pulverizer chamber by a rotor-shaft-mounted exhaust fan.

Grinding is accomplished in the air stream by attrition of crumbs. Pulverized product then goes to classifier and expansion chamber fitted with a "spinner" that eliminates over-sized crumbs by centrifugal action.

7. **Problem:** Blending and grinding of sugar, cocoa powder, and milk solids to the same particle size for making hard-butter coatings.

Solution: In a single process, blended and pulverized drys are produced at 1,000 lb. per hr. in a Pulvocron—an air attrition, impact pulverizer with radial, inward air classifier employing differential centrifugal pressure. Machine consists of a triple-unit feeder with three

Chemiseal® Packings

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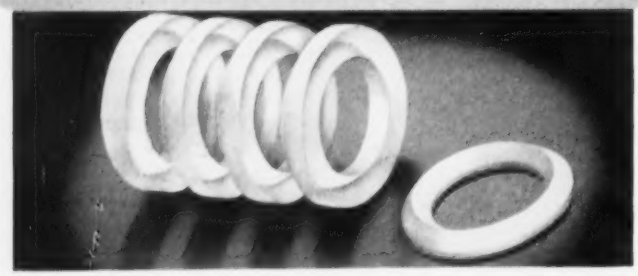
cleanest food plant packings

non-corrosive · non-absorbent · non-contaminating



V-Rings. Distinctive tapered V design offers greater flexibility and resiliency, providing necessary seal at low gland pressure and reducing torque on valve stem. Antihesive properties guard against valve packing "freeze". Supplied in sets with or without TEFLON square-end adaptors.

Cup and Cone Rings. Cones deform inwardly to seal at the spindle, while cups expand outwardly against stuffing box wall, effecting a tight seal at low gland pressure with minimum friction on valve stem. Antihesive properties make this packing ideal for emergency shut-off service.

Wedge Rings seal at unusually low gland pressure required for valves manufactured from Haveg, Karbate, ceramics, etc. Provide space for thermal expansion, suiting them for slow-speed pumps, agitators, auto-claves, etc. Adaptable to spring-loading if desired.

Write for Catalog AD-155.

United States Gasket Company
Camden 1, New Jersey

United States Gasket *Plastics Division*
OF THE GARLOCK PACKING COMPANY

integrally housed, variable-speed screws for proportioning. From pulverizer, drys are pneumatically fed to cyclone collector, then worm-screw-conveyed to a mixer. Here, fats are introduced before the final coating goes to the enrober.

Driven by a 50-hp. motor, the pulverizer consists of three grinding plates, with 12 staggered and balanced beaters attached to each plate. Operation is by impact of beaters against materials, and attrition between beaters and liner in grinding chamber. Further size reduction results from air attrition produced by high turbulence.

Classifying chamber comprises primary and secondary plates, with whizzer blades on the latter. This unit, operated by a separate motor and shaft, provides precision control over final product.

Particle-size control is maintained by simple adjustments of grinding plates, classifying units, or volume of internal air.

There are two tailings returns having variable openings for maximum flexibility and product control. Return tubes automatically recirculate coarse material to grinding chamber.

8. Problem: Grinding granulated sugar to below 325-mesh for making a white, creamy, non-gritty icing.

Solution: Fondant-grade sugar is now produced, at 1,200 lb. per hr. by running granulated sugar through a Pulvocron.

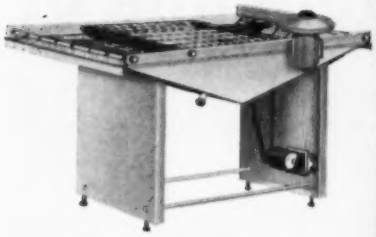
How Lab Is Equipped

To handle such diverse problems as those described here, this lab employs four different units for size-reduction, two for size-separation, and three for mixing. There are facilities for controlled heating and cooling during grinding and mixing. Also, liquids and gases can be added to solids—and solids to solids—during pilot processing.

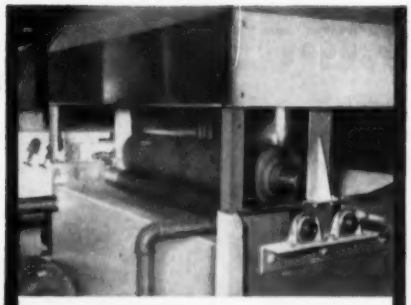
Size-reduction equipment includes a straight attrition mill, a screen-type hammer mill, a high-speed attrition and classifying machine, and a high-precision, fine-grinding and classifying unit utilizing air attrition and impact.

For separating, there are agitating and rotating screen-type units that control particle size of pulverized products.

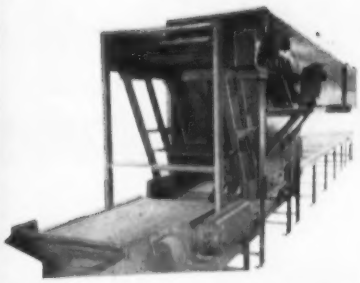
And for mixing, there are a triple-action, batch-type ribbon blender, a high-speed mixer with high shearing action, and a continuous slow-speed unit with double rotor.—*End*



Meat Tenderizing Dip Tank. Continuous sanitary means of tenderizing strip steak and beef cuts.



The Continuous Paper Filter. Adaptable to food cooking processes for product improvement and oil savings.



The Multi-Tier Cooler. Features controlled cooling and gentle handling with savings of costly floor area.

The Batterer and Breader. Flexible, sanitary for meat, fish, shrimp and other seafood products.

PROCESS WITH PROFITS

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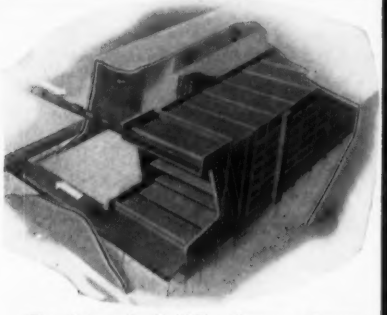
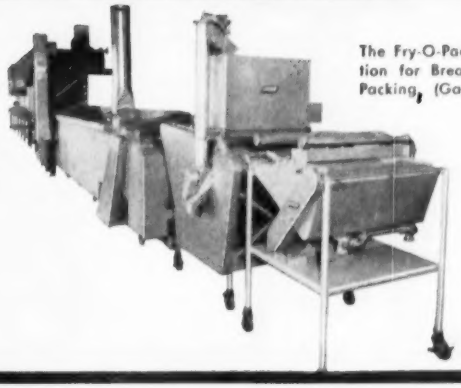
- Space Savings
- Improved Products
- Reduced Labor Costs



The Automatic Multi-Tier Freezer. Proven and accepted for multiple advantages.



The Fry-O-Pac Line with continuous operation for Breading, Cooking, Cooling and Packing. (Gas or Electric Cookers)

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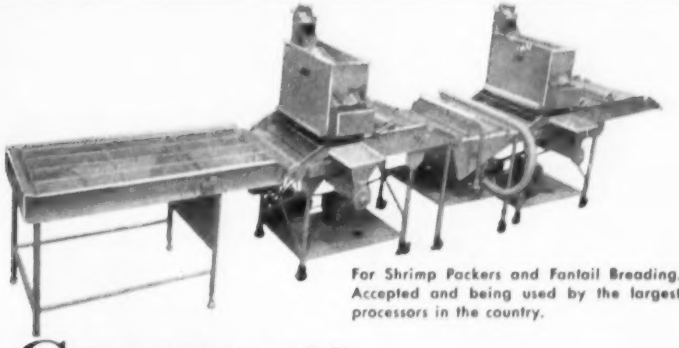

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POWELL—the most complete line of Alloy Valves* for Corrosive Services

Fig. 2194—Small Ni-Resist O.S. & Y. Gate Valve for 225 W.O.G. Larger sizes, flanged end, and swing check valves in Ni-Resist also available.

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It's a fact . . . Powell offers more kinds or types of valves, available in the largest variety of corrosion-resistant metals and alloys, to handle practically every known corrosive fluid. The complete line includes gates, globes, angles, checks, "Y's", relief, flush bottom tank valves and others—for pressures from 150 to 1500 WP. A few are shown on this page.

Your local valve distributor will be glad to tell you all about them. If none is near you, write to us for the full facts on Powell Valves and Powell Engineering Service.

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Dependable Valves Since 1846
CINCINNATI 22, OHIO

**Powell Alloy (Corrosion Resistant) Valves are available with screwed or flanged ends. Flanged end valves conform to latest standards.*

Fig. 1832—Stainless Steel Gate Valve for 200 W.P. Screwed-in bonnet, inside screw rising stem, solid wedge disc.

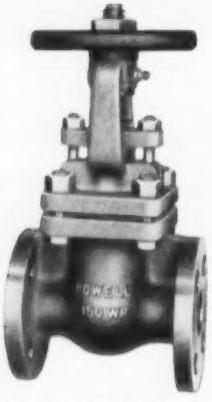

Fig. 2491—Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke, solid wedge disc. Can be supplied with interchangeable split wedge disc

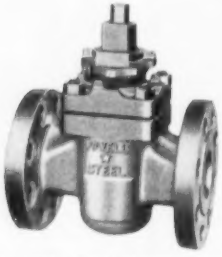

Fig. 1559—Steel Lubricated Plug Valve for 200 W.O.G. Screwed gland type. 6" and larger valves can be furnished for gear operation.

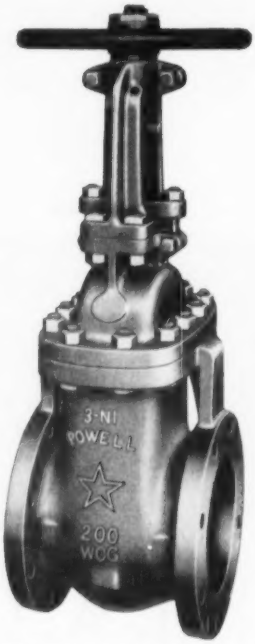

Fig. 1893—Large O.S. & Y. Gate Valve for Paper Mill Service. 3% Nickel Iron Body, bonnet, yoke; stainless steel stem, screwed-in seat rings; Ni-Resist wedge.

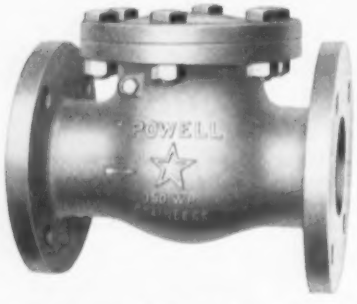

Fig. 2433SS—Large size Stainless Steel Swing Check Valve for 150 W.P. Bolted Cap.

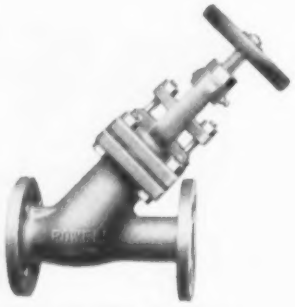

Fig. 2107—Stainless Steel "Y" Valve for 150 W.P. Plug type disc. Face to face and end flange dimensions conform to latest standards.

VIBRATING CONVEYORS are seen serving as picking tables. They permit thorough product inspection. Later, corn is gently sped to cutters.

'Fluidized' Conveying

Streamlines Processing

Compact system of oscillating carriers boosts cannery's output of quality-controlled corn and sweet potatoes. Cleanup, maintenance simplified, too

SCORE another point for oscillating conveyors.

This time they're synchronizing high-speed processing steps to keep lines operating at peak efficiency.

Furthermore, these compact units are greatly simplifying quality control, sanitation, and maintenance.

The plant spotlighted here is Pine Grove Canning Co., St. Martinsville, La., where corn is processed 18 hr. a day for 10 weeks, production averaging 96,000 cans (No. 303) daily.

Thus, topnotch performance is a must. And it's neatly accomplished with four oscillating conveyors (Flexmounts, Link-Belt Co., Chicago), which serve as inspection tables and feed huskers and cutters.

Sweet potatoes make up another pack. Efficiently handled in the December-April season, the output for a 12-hr. day ranges 1,800-3,000 cases of mixed sizes—Nos. 2½ (squat), 10, and 303.

And pilot runs have been made with rice.

Conveyors consist of one-piece metal troughs (10 gage), 4 in. deep and 18 in. wide. Mounted on resilient supporting legs, they're oscillated by constant-stroke eccentrics driven by 1-hp. motors.

In handling corn, these units pace operations by servings as "accumulators" for huskers and cutters. Designed for continuous feeding, they eliminate product recirculation and cutback of the unloading system.

Incoming corn is fed to huskers on a 30-ft. section. Another pair of oscillating conveyors (each 50 ft. long) serve as inspection tables. And, husked corn is discharged to a fourth unit (35 ft. long) that leads to cutters.

This system has also paid off by:

. . . **Improving quality control.** Units' gentle oscillations curb product damage. When serving as picking tables, they "fluidize" the corn, thereby exposing defects. Furthermore, conveyor action can easily be adjusted to product requirements.

. . . **Simplifying cleanup.** Conveyors are self-cleaning. Their high sides eliminate product spillage.

. . . **Minimizing maintenance.** Only the drive need be lubricated. Flexible members supporting the trough need no attention.

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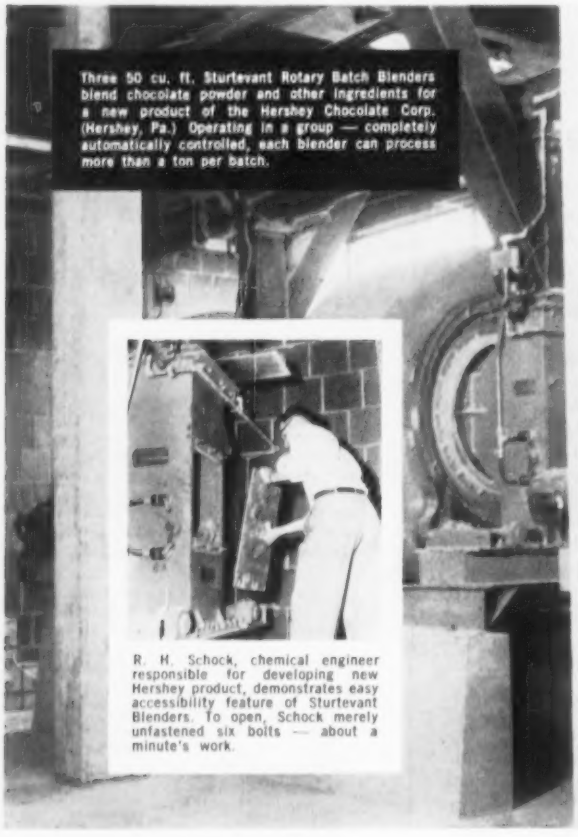
Sturtevant Blenders Help Hershey Control Consistency of New Product

Every chocolate lover knows that the texture and flavor of Hershey products always can be depended upon. Consistency is important to the Hershey people. With a new product just developed, they control consistency by using carefully tested ingredients, weighed automatically, and then mixed in Sturtevant Blenders. Operation of the Blenders also is automatic — even to their timing.

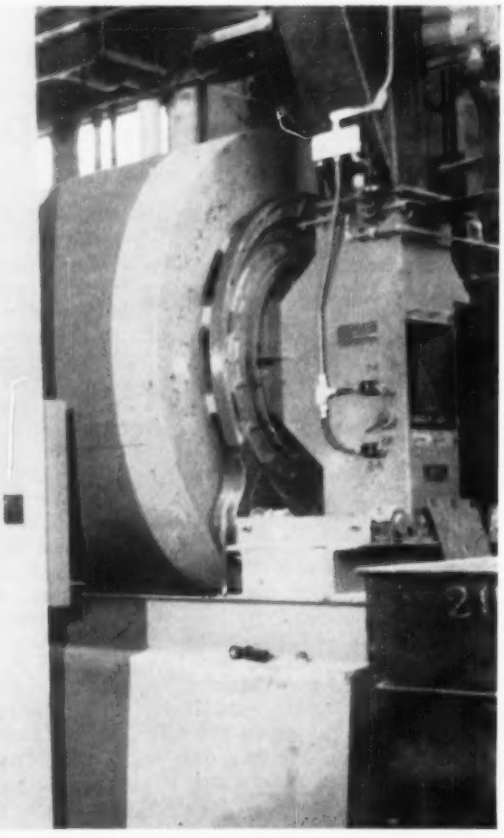
Consistency is a problem to many food manufacturers and processors, and frequently an all-important step in its attainment lies in blending. Sturtevant Blenders start delivering highly intimate blends in as little as 1 to 2 minutes — an entire blending cycle takes only 3 to 5 minutes. Consistency of each batch is assured by the Sturtevant 4-way blending action. The interior scoop distributing system operates gently, yet always produces a thoroughly integrated blend.

Sanitation is also of prime importance in food plants. Sturtevant dust-sealed design keeps ingredient fines inside the drum, oil and grease outside (no bearings inside drum). Moreover, drums are self-discharging, leaving little residue. 'Open-Door' accessibility allows entry and inspection in a matter of minutes. Complete cleaning can be done automatically (with the installation of injection sprays) or manually — with practically no downtime. Hershey, for example, keeps its three Sturtevants clean with the expenditure of only an hour per week of maintenance time.



Three 50 cu. ft. Sturtevant Rotary Batch Blenders blend chocolate powder and other ingredients for a new product of the Hershey Chocolate Corp. (Hershey, Pa.) Operating in a group — completely automatically controlled, each blender can process more than a ton per batch.

R. H. Schock, chemical engineer responsible for developing new Hershey product, demonstrates easy accessibility feature of Sturtevant Blenders. To open, Schock merely unfastened six bolts — about a minute's work.



Sturtevant Rotary Batch Blenders are available in nine standard models with capacities ranging from 25 to 900 cu. ft. Operation may be automatic, semi-automatic, or manual. Liquid injector pipes may be added for injecting liquids during blending or for rinsing afterwards. Materials of construction are carbon steel, stainless or Monel metal. Write today for descriptive brochure.

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High Temp Pasteurization Cuts Off-Flavor in Milk

Samples of homogenized milk pasteurized at 163, 168, 173, 178, 183, and 188 F. for 17 sec. during winter and summer months, and bottled in clear glass, were stored at 40F. in the dark and under 20 fc. of incandescent light for 0, 1, 2, and 3 days.

Rate of ascorbic acid loss, and degree of oxidized flavor development, decreased with increases in pasteurization temperatures for all samples exposed to the light.—*J. Dairy Science*, 862-66, July 1957.

Eggwhite Substitutes

Replacing eggwhite with a cellulose ether in a cake mix produces a finer texture and minimizes the cost, according to patent specifications.

Tests showed that, at a ratio of 0.5 oz. of cellulose ether for each oz. of replaced eggwhite solids, or 1 oz. for each 7 oz. of replaced liquid eggwhite, texture of cake was finer than when eggwhite alone was used.

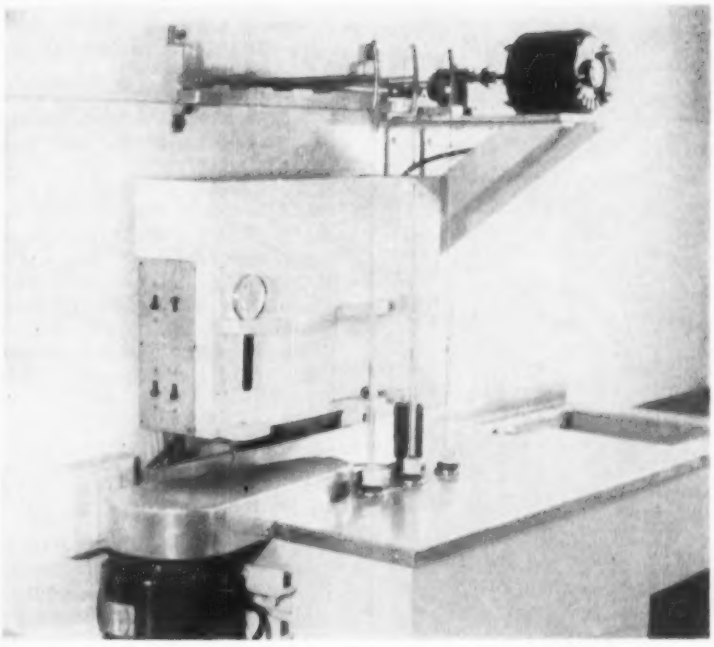
Ethers suitable for this purpose are methyl cellulose, hydroxypropyl methyl cellulose, and carboxymethyl hydroxethyl cellulose, giving best results in the order named.—U. S. Patent 2,802,741, Aug. 13, 1957.

Ultrasonic Treated Milk Has Good Frozen Life

Marked improvement in quality of thawed frozen milk is said to result from an ultrasonic treatment developed at the National Institute for Research in Dairying in England.

The process comprises pasteurization of the milk by either the hold, or HTST method, then subjecting it to carefully controlled ultrasonic vibrations. This is followed by filling into plastic containers, which are heat-sealed, frozen at +5F. in less than 60 min., stored at 5-10F.

It is claimed that milk thus treated has a storage life of 12 months. On thawing, physical properties and consumer qualities are indistinguishable for those of high quality pasteurized milk. It is said to keep as well as the original pasteurized product and, on standing, develops a normal cream line.—*Dairy Engineering*, 74 (7), 193, 1957.



Speeds Milk Adulteration Tests

An improved cryoscope that has considerably greater capacity and dependability, and eliminates other shortcomings of the standard Hortvet method has been developed in Australia and is now produced by a Sydney company.

Employed as the cooling medium is a thermostatically controlled alcohol-water mixture that is less inflamable than the ether previously used. Standard Hortvet tubes and thermometers are used, as is also the regular method of determination.

Latest model features a wooden structure with a stainless steel top. Freezing tank is fabricated from copper and insulated with 2 in. of cork (see photo above).

Three tubes and 3 thermometers, and an overhead mechanical agitating gear enable three samples to be tested at one time.

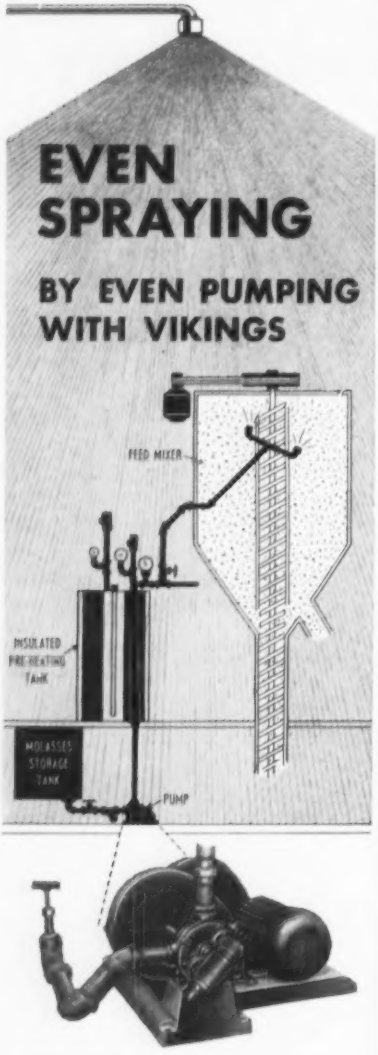
Provision is also made for a control thermometer and thermostat in the freezing bath. A small ice container is incorporated in top to supply the small pieces of ice required in the testing procedure. Samples are precooled in a cold water bath situated on the right of the freezing bath.

Refrigeration is by two ½ hp. Freon compressors. Each is controlled by a pressure switch, and each is separately connected to flooded evaporators with low side float controls. Evaporators are fully submerged in the primary tank containing a 50% water-alcohol mixture held at −9-11C.

Mixture is pump circulated through coils in freezing bath, water bath, and small ice tank. A sensitive thermostat with a differential of ± 0.01 deg. opens and closes a solenoid thus effectively maintaining a −3C. temperature in the freezing bath.

In operation, milk sample is cooled to approximately 1 deg. below its expected freezing point and a small ice crystal added. Freezing then commences and the temperature rises due to latent heat given up.

As temperature approaches its highest point, thermometer is tapped lightly. Final reading should be a steady for at least 1 min.—McGraw-Hill World News. (*Turn page*)



Even spraying is a basic, necessary feature of the "Spray-Mo-Las" stock feed sprayers produced by Bob F. Riegel of Riegel & Son Elevator, Woodington, R. R. 4, Greenville, Ohio. The unit illustrated sprays molasses on dry ground feed. Riegel also makes a "Spray-Mo-Fat" unit for spraying animal fats on feed. Both units are equipped with Viking Pumps because Vikings deliver a smooth, constant flow of molasses or fats to the spray jets, when feed is mixed.

Because of positive delivery by Viking Pumps, uniform quality of feeds can be maintained, so Riegel spraying equipment has found a ready market among feed dealers.

Smooth, even pumping is a built-in quality of every Viking. If you have a pumping problem requiring constant flow, Viking can be your answer. In fact, if you have any pumping problem, see your nearby Viking distributor, or write for bulletin 57Se.

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Advances in Technology

Cottage Cheese Yield

In a study of factors influencing yield of cottage cheese, 15 lots were made and analyzed. In addition, the skimmilk, whey, cheese, and water after washing the cheese, were analyzed for total solids.

Results showed that: (1) There was no difference in solids recovery in cheese with either the acid-coagulation or rennet-extract method; (2) skim of higher solids (9.71%) resulted in better recovery than low solids (8.92%) skim (percent recovery amounted to 38.8 and 32.2%, respectively), and (3) total solids lost in the whey and wash-water, amounted to 54.5 and 11.0%, respectively, of that present in the skim used.—*J. of Dairy Science*, 713-21, June, 1957.

Operating Variables In Hydrogenation

Cottonseed oil hydrogenation involves selectivity, or the preferential hydrogenation of poly-unsaturated acids, compared to mono-unsaturated acids, and is affected by operating conditions.

Effects of temperature, pressure and nickel catalyst concentration on hydrogenations of 1400 g. batches of cottonseed oil, subjected to vigorous agitation that essentially eliminated mass transfer effects, indicated that the overall rate was represented by,

$$r = 8.21 \times 10^{-8} (T - 103) \quad (W) (P) I.V.)$$

Where r is hydrogenation rate in iodine value (I.V.) drop per min., T temperature in deg. C., W weight percent nickel, and P hydrogen pressure in psi. The equation applies to oils of iodine value 80 or less, and if mass transfer resistance is eliminated.

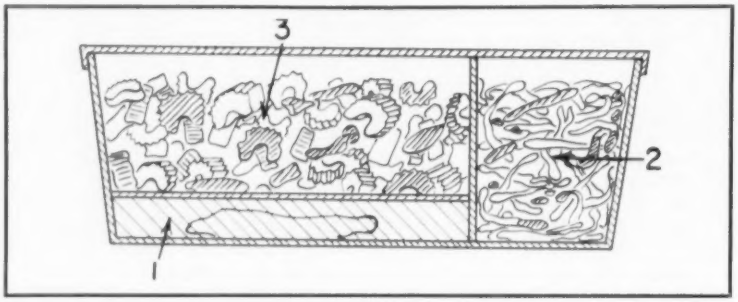
Under these conditions selectivity was not appreciably affected by temperature, iso-oleic acid formation increased slightly with the temperature and both decreased with pressure increases. A surface reaction between atomic hydrogen and physically adsorbed unsaturated compounds seems to control the reaction rate.—*Ind. & Eng. Ch.*, 825-31, May, 1957.

Gossypol is Source of Color In Cottonseed Oil

Gossypol from cottonseed reacts with triglyceride oils to form yellow products not removable by alkali refining. And these are possible intermediates in red color formation.

Examination of crude cottonseed oils showed that their gossypol content was very low (0.00-0.04%). As the samples were not analyzed until received at the laboratory, and it was impossible to say whether the content had undergone change in the interval. But by adding gossypol to crude hydraulic-press oil it was shown that much of it disappeared in an hour.

Secondary reactions occurred in cottonseed oil and in tripelargonin, in which gossypol was lost, giving rise to red coloration products which are not removed by alkali refining and on bleaching. This suggests that initial reaction of gossypol in oils is an ester exchange and that secondary reactions result in production of a red coloration product.—*J. Amer. Oil Chemists' Soc.*, 399-401, Aug. 1957.



Frozen Chinese Dinners

Preparation and packaging of a Chinese food product that retains the maximum color, crunchiness, and flavor is the object of a recent patent.

In the procedure, a suitably flavored sauce is prepared, cooled and placed in bottom compartment (1) of special container (see drawing).

Vegetables are cut into long thin slices, blanched and allowed to drain

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If you're considering a product improvement or a new product, you'd do well to investigate Pro-80 protein enrichment. Recognizing the increasing consumer preference for high protein foods, many successful food processors have turned to our Pro-80 Vital Gluten (80% pure wheat protein m.f.b.) to build greater food value into their products. They've been rewarded with additional volume. Possibly you will too.

Pro-80 adds food value to these and other foods

- *breads*
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- *puddings*
- *baby foods*

Pro-80, extracted from wheat, hydrates rapidly, blends smoothly, is bland and compatible—adds no taste or odor of its own.

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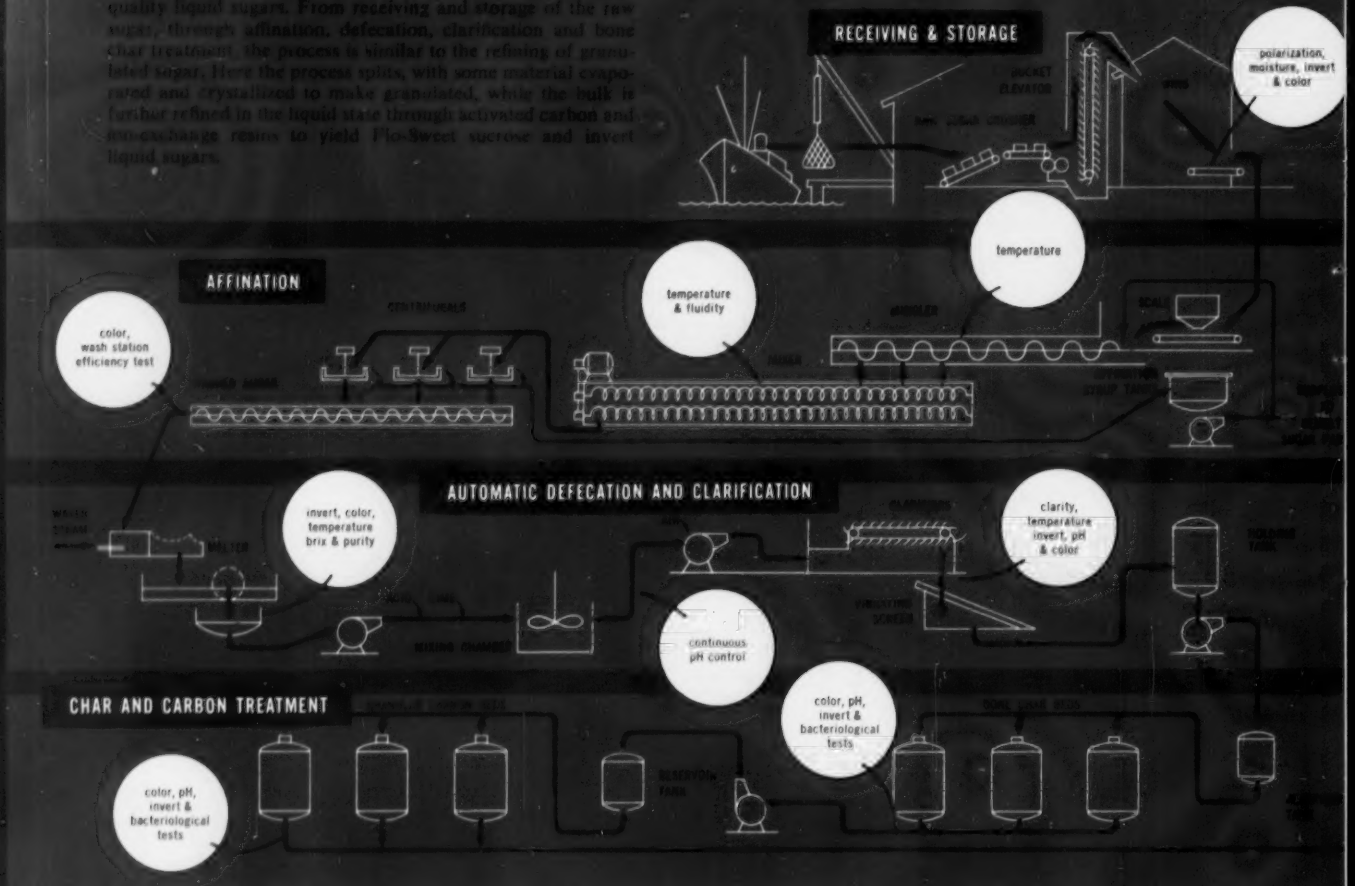
FLO-SWEET QUALITY CONTROL STEPS

At every step in refining, complete laboratory facilities safeguard the quality of Flo-Sweet liquid sugars. This diagram shows the major steps in refining raw sugar to produce high quality liquid sugars. From receiving and storage of the raw sugar, through affination, defecation, clarification and bone char treatment, the process is similar to the refining of granulated sugar. Here the process splits, with some material evaporated and crystallized to make granulated, while the bulk is further refined in the liquid state through activated carbon and ion-exchange resins to yield Flo-Sweet sucrose and invert liquid sugars.


RECEIVING & STORAGE
polarization, moisture, invert & color
temperature
AFFINATION
color, wash station efficiency test
temperature & fluidity
AUTOMATIC DEFECATION AND CLARIFICATION
invert, color, temperature brix & purity
clarity, temperature invert, pH & color
continuous pH control
CHAR AND CARBON TREATMENT
color, pH, invert & bacteriological tests
color, pH, invert & bacteriological tests

SEE HOW FLO-SWEET REFINING CONTROLS

Flo-Sweet's remarkably low turbidity consistently ranks among the lowest in the sugar industry. Here a laboratory technician uses a nephelometer for precise determination of turbidity—a routine check to safeguard Flo-Sweet quality...and thus the quality of your own food products.

Talk about quality control! Each yellow disc in the flow chart above shows a major quality control station in the refining of Flo-Sweet liquid sugar! As you can see, there are dozens of control points . . . and several times that number of actual inspections and tests!

Flo-Sweet's thorough quality control program has resulted in an entirely new concept of liquid

REFINED SYRUPS

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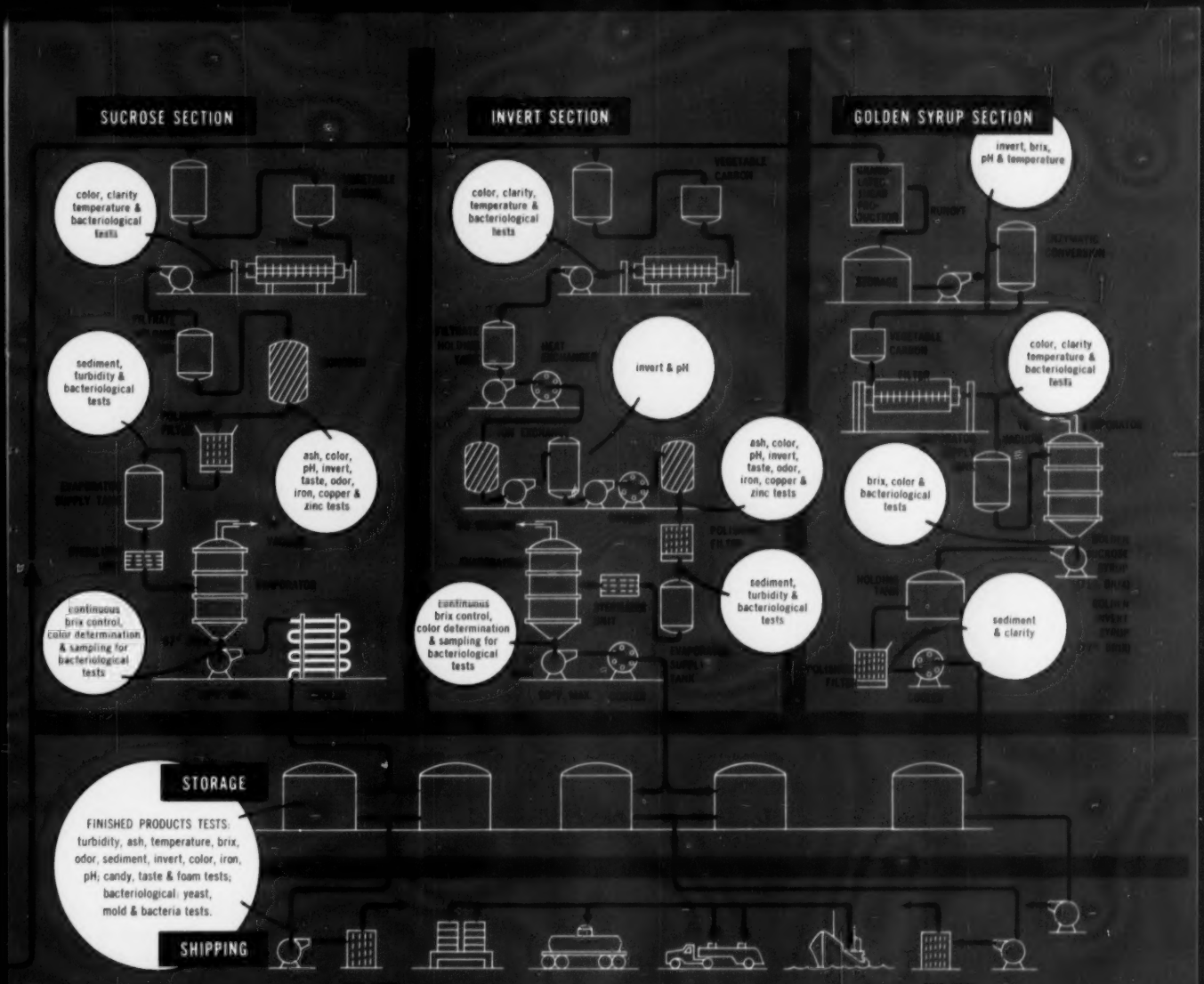
SUCROSE SECTION
color, clarity temperature & bacteriological tests
sediment, turbidity & bacteriological tests
ash, color, pH, invert, taste, odor, iron, copper & zinc tests
continuous brix control, color determination & sampling for bacteriological tests
INVERT SECTION
color, clarity, temperature & bacteriological tests
invert & pH
ash, color, pH, invert, taste, odor, iron, copper & zinc tests
sediment, turbidity & bacteriological tests
continuous brix control, color determination & sampling for bacteriological tests
GOLDEN SYRUP SECTION
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color, clarity temperature & bacteriological tests
brix, color & bacteriological tests
sediment & clarity
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sugar . . . a type of sugar so high in quality that it has literally "set the standards" in industries where previous specifications were far too broad for true quality comparisons! *Whether you evaluate sugar quality by color . . . by taste and aroma . . . by precise laboratory analysis . . . or by its performance in your own products—you will find Flo-Sweet of consistently finer quality than any other sweetening agent, liquid or granulated.*

Why not explore with a Flo-Sweet engineer the full advantages of a Flo-Sweet system in your plant . . . the cost advantages as well as the quality advantages. Test Flo-Sweet yourself, in comparison with any other sugar. Try it in your own production. Flo-Sweet can save you big money at the same time it's helping you boost quality!

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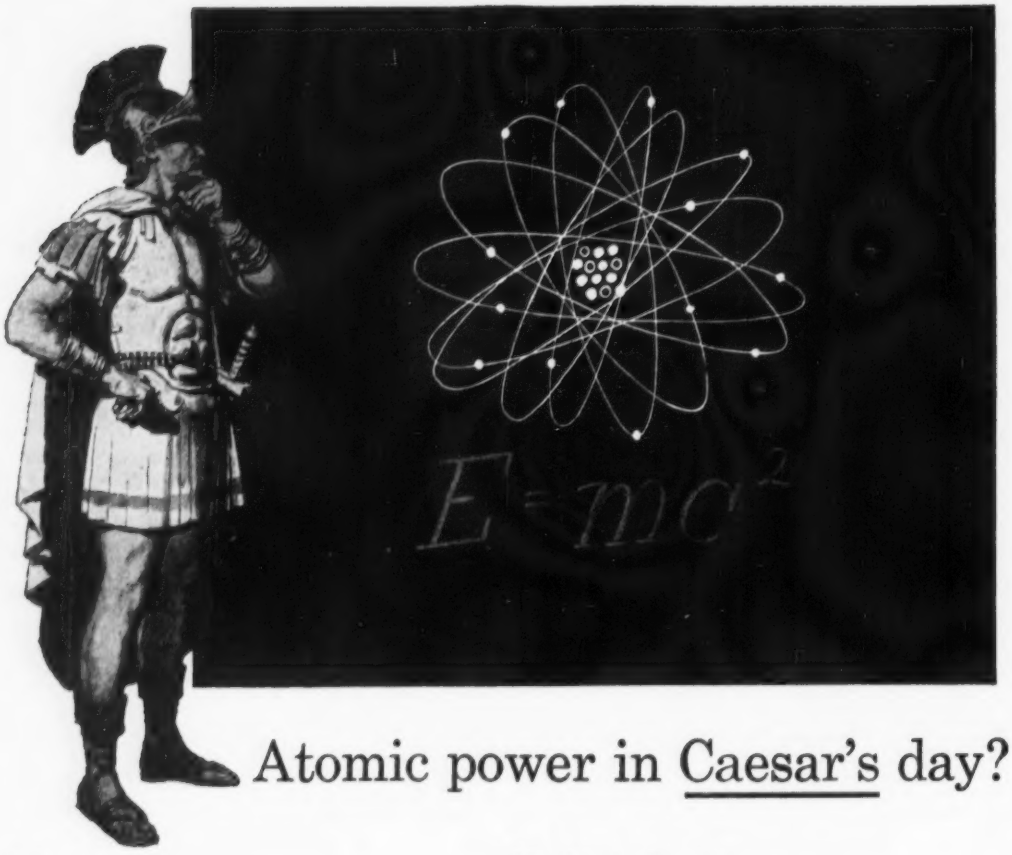

Atomic power in Caesar's day?

Certainly!

It was there, in the ground, in the air and water. It always had been. There are no more "raw materials" today than there were when Rome ruled the world.

The only thing new is knowledge . . . knowledge of how to get at and rearrange raw materials. Every invention of modern times was "available" to Rameses, Caesar, Charlemagne.

In this sense, then, we have available *today* in existing raw materials the inventions that can make our lives longer, happier, and inconceivably easier. We need only *knowledge* to bring them into reality.

Could there possibly be a better argument for the strengthening of our *sources* of knowledge – our colleges and universities? Can we possibly deny that the welfare, progress – indeed the very *fate* – of our nation depends on the quality of knowledge generated and transmitted by these institutions of higher learning?

It is almost unbelievable that a society such as ours, which has profited so vastly from an accelerated accumulation of knowledge, should allow anything to threaten the wellsprings of our learning.

Yet this is the case

The crisis that confronts our colleges today threatens to weaken seriously their ability to produce the kind of graduates who can assimilate and carry forward our rich heritage of learning.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of mind *most qualified* to teach; overcrowded classrooms; and a mounting pressure for enrollment that will *double* by 1967.

In a very real sense our personal and national progress depends on our colleges. They *must* have our aid.

Help the colleges or universities of your choice. Help them plan for stronger faculties and expansion. The returns will be greater than you think.

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

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8-12 hr. to eliminate most of the free water. Then the bean sprouts, which have been handled separately, are placed in compartment (2), and the other vegetables in (3). Cover is placed on package, which is wrapped and frozen.

In preparing the meal, frozen sauce is melted, mixed vegetables are added and heated and, finally, the bean sprouts. This is said to result in a meal that looks, tastes, and feels like the home-cooked product.—US Patent 2,801,930, Aug. 6, 1957.

High-Protein Food Product

Vegetable proteins of oilseed origin, preferably soy protein, can be used in a patented process to prepare a food product whose nutritive value approximates that of meat.

Product varies in texture from a flowable semisolid to a cheese consistency and is capable of withstanding relatively high temperatures without change in consistency or development of off-flavor. It is particularly useful for invalids or others whose diets must meet certain requirements.

Soy bean flakes are extracted with a $Ca(OH)_2$ solution of 0.003 molarity. Steam is introduced into the agitated mixture until a temperature of 140F. is reached. This is followed by centrifuging to obtain a clarified extract of pH 6.8, to which HCl is added to coagulate the protein which is centrifuged and washed.

Washed cake is suspended in water and digested with a proteolytic enzyme such as papain and trypsin until 20-30% hydrolysis has occurred. Enzymatic action is stopped and pH adjusted to 6.5. Various additives, such as fat, vitamins, and minerals, may be incorporated at this point.

Finally, the product is milled to insure uniformity of texture, then canned in the conventional manner.—U.S. Patent 2,802,738, Aug. 13, 1957.

Olive Spoilage Organisms

"Zapatera" is a malodorous fermentation of brined olives that progresses from an initial "cheesy" or "sagey" odor to a fecal stench, accompanied by loss of acidity and development of lower aliphatic acids, including, formic, propionic, butyric, valeric, caproic, and caprylic.

Cl. spp. have been found in zapatera spoilage, but since these bacteria do not produce propionic acid, species of *Propionibacterium* were sought in spoiled olives.

From 87 samples, 68 isolates of *Propionibacterium* were obtained, 46 of which were identified as *P. zeae* and 22 as *P. pentosaceum*. Both were able to produce propionic acid and a cheesy odor in olive brine fortified with yeast extract. Both are salt tolerant and were able to grow in media of pH 4.8-5.2.

While the presence of propionic acid in zapatera olive brines may be due to these organisms, they do not carry the odor development far enough to provide a complete explanation of the spoilage.—*Applied Microbiology* 5(4), 267-71, 1957.

Moisture Plays Key Role In Bacterial Infection

Surface drying of food products offers some protection against invasion by spoilage organisms which differ in equilibrium relative humidity at which they will start to grow.

This was demonstrated by drying nutrient films inoculated with test organisms on glass rods, and suspending them over food sample. Slices of bread 1.5 mm. thick, taken at successive distances from the surface of a freshly baked and cooled loaf, showed for example, that at 2-3 mm. below the surface *E. coli.* could readily grow.

Moisture-proof wrappings that inhibit surface drying, or trap moisture taken up during cooling, may therefore encourage bacterial growths that would not occur with a nonmoisture-proof wrapping.—*J. of Science of Food & Agr.* 404-14, July 1947.

Confirms US Experience With Chlortetracycline

One-year-old white Leghorns of average weight (4 lb. 9 oz.) were used in English experiments with chlortetracycline (CTC). Part of the carcasses were eviscerated and covered with ice and water containing CTC, part were not eviscerated but received the same treatment, following which they were handled according to the usual marketing practices. Untreated controls were also prepared.

In refrigerated storage at 34 F., eviscerated poultry kept well for 3

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Better Food Mixing
at LESS COST
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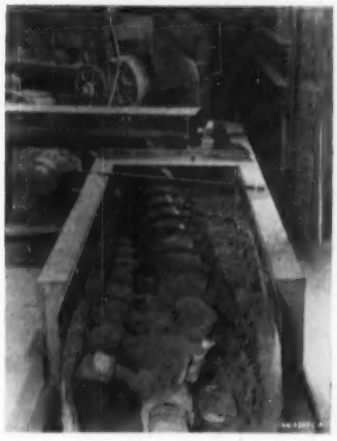
ANTHONY
CONTINUOUS
MIXERS



Here is an Anthony Continuous Mixer in action, producing a quality mix of the exact proportions needed.
These continuous mixers will handle such items as flour, baking powder, cereal by-products, fondant, cake mixes and starch jelly easily and profitably.
Our mixers with stainless steel troughs and paddle shaft assemblies are designed for longer life and lower operating costs. Capacities of the standard sized mixers range from a few hundred pounds per hour to as much as one hundred tons per hour and will meet most process requirements. However, we will gladly design and engineer special mixers to fit your particular needs. When used in connection with a continuous weighing system, the whole mixing operation automatically produces consistently uniform mixes at less cost to you.

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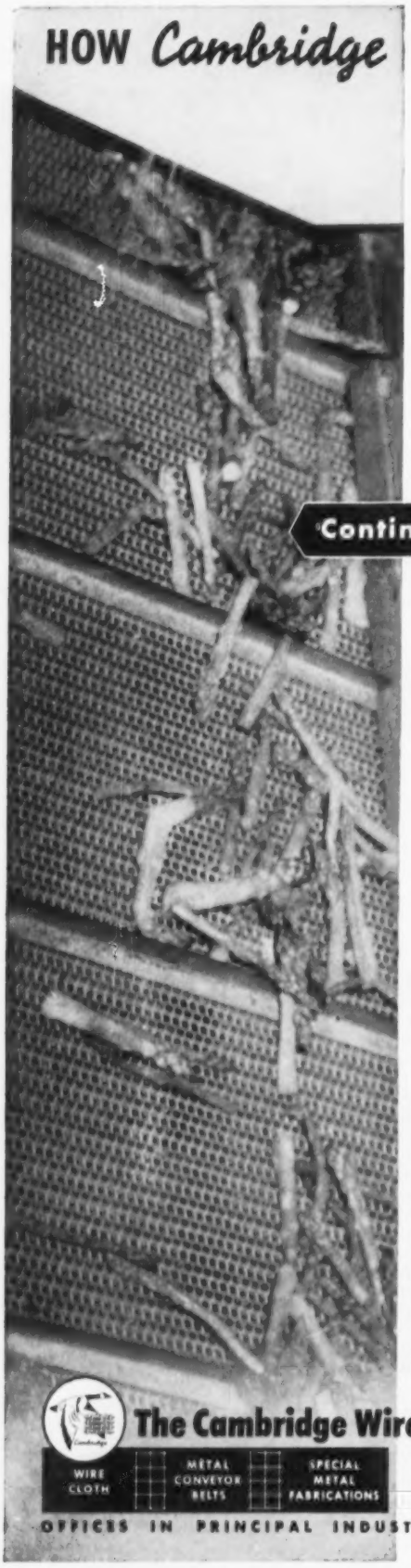

HOW *Cambridge* **Wire Mesh Belts**

reduce food processing costs

By providing continuous movement through all phases of food processing, wire mesh conveyor belts minimize manual handling, enhance quality and uniformity, improve sanitation and reduce damage. Meat, poultry, candy, baked goods, fruit and produce can be frozen, canned, fresh-packed or baked faster and easier on moving belts. EXAMPLE:

Continuous Washing

MOVING BELT carries asparagus continuously from wash tank through a spray rinse on the way to the blancher.

SPECIAL CROSS FLIGHTS pick up stalks from surface of the wash water, hold them on the belt during inclined travel.

OPEN MESH permits rapid drainage of wash water, increases uniformity by providing free circulation of steam in blanching and of sub-zero air in freezing tunnel, allows small waste particles to fall through so they won't contaminate belt or product.

RUSTPROOF ALL-METAL BELT provides long life, is impervious to damage from process solutions, heat and cold . . . has no odor . . . will not contaminate product.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut food processing costs with continuous processing on woven wire conveyor belts. Look for his 'phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

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Advances in Technology

weeks. Without refrigeration, CTC did not extend storage life of eviscerated poultry, nor was it effective in the preservation of uneviscerated birds held at 59F.

Type of spoilage consisted of an abundant growth of yeasts and molds. This is quite different from the usual bacterial sliming that occurs in eviscerated poultry at 50 F.—*J. of Science of Food & Agr.*, 485-89, Aug. 1957.

Corn Steep Liquor Boosts Lactic Acid Production

Addition of sugars and amino acids to cucumber brine has been suggested as a method of increasing acid production, and a patent has been issued covering use of corn-steep liquor (1 oz./gal. of brine) for the purpose.

All three products were tested on barrels of Size 2 cucumbers packed in 30 deg. salometer brine, in 1953 and 1954. Acid production was not stimulated by the addition of 0.5-1.0% sucrose. Cystine and tryptophan (0.0025% of each) also had no appreciable effect.

Corn steep liquor, however, enhanced acid formation, the level reaching about 0.73% in 20 days. And sugar utilization also increased. —*Applied Microbiology*, 5(4), 253-61 1957.

Air In Bottled Beer

A simple procedure for determining air content of beer, gives excellent results on recovery tests with known amounts of air. It comprises opening the bottles under water, upside down, then inverting them slowly and permitting the gases to escape under a funnel or bell filled with water. From here they can be transferred to a collection and absorption burette for measurement.

By this method, an experienced analyst can carry out about 200 determinations in an 8-hr. day.

With it a study of the different filler valves on 50- and 60-spout fillers showed that the air content of the bottles filled depended on a particular filler valve. Interchanging valves from one assembly to another shifted the air contents of the bottled beer accordingly. Interchanging vent tubes did not affect air levels.—*Brygmesteren*, (European Brewery Convention. Congress Issue) 173-84, June 1957. (In English).

"How'd those last five loads of J&L drums come in, Joe?"

"Checked 'em all with the drop light, Boss. Clean as a whistle... never saw a better lining job."

- J&L specialists, backed up by modern research, are ready to consult on your toughest packaging problems.
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- J&L steel containers provide engineered packaging for dependable transportation and safe storage.
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FE STAFF

IN THIS BUSINESS—food-plant operation—solving just *one problem* will rarely put you on easy street.

More often, successful performance depends on your ability to surmount a *number of problems* at once. In short, it generally takes an overall approach—with a great deal hinging on the capacity of your executives and engineers to join forces to carry it out.

Here, the effective broad-front attack mounted by the enterprising Good Humor Corp., of Maspeth, N. Y., has been outstanding. This company, not so long ago, was grappling with matters of production rates and inventory, quality control angles, high-speed packaging posers, shipping procedures, and engineering.

Today, checks of output and product-quantity have been greatly simplified by use of special color-and-number carton-sealing tapes. And this system also speeds quality-control operations.

Furthermore, progressive engineering has resolved a number of challenging packaging requirements, while adoption of unit-load carts has streamlined handling and shipping. Additional performance credit goes to the company's special rooftop refrigeration system.

Big Benefits of Taping System

To start with, there is a special color of carton-sealing tape for each ice cream item—identifying flavor and variety. Thus, along the whole chain from production line to consumer there's never any confusion concerning carton contents.

Moreover, each tape is stamped with individual numbers running up in sequence. The object is to give each carton its own identifying number when it is sealed.

And here are the advantages thus gained and the problems eliminated:

▶ Hourly checks on production are now easily made by noting the number on the carton coming through the line. This number minus the one taken on the previous check gives the last hour's production rate.

To make this output check possible, the foreladies are allotted specific sets of tapes at the start of each work period. In this manner, production slowdowns can be quickly spotted, traced, and corrected.

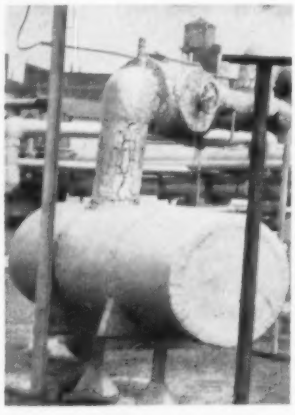
▶ Today, amounts of goods in storage and quantities shipped are also readily summed up, by virtue of the colored and numbered-tape system. Formerly, effective inventories were extremely difficult to make and often inaccurate.

▶ As for quality control, any product complaints can be traced by the number on the carton. The whole trail, all the way back through packing to the mix storage vats from which the product was taken, can thus be checked to ferret out the sources of trouble.

The company has invested in 1,500 custom-built bakery-type racks for handling its goods. Each of these is loaded completely with one product variety (easily recognized by tape color). Unit-loading also aids in inventory checks.

The carts are pushed, intact, into the ice cream hardening room, then later into frozen storage. Subsequently, they're loaded into special tractor-trailers for movement to distribution points. Aiding this trailer-loading job is a portable elevator fitted with handy ramp for quick roll-on of the racks.

Employing this cart-load system, there's no need for individual handling of cartons, except when initially assembling the loads and when



ADVANCE-DESIGN sundae fillers turn out cups at 120-per-min. clip. Teamwork between Good Humor and manufacturer sparked their development.

Really Makes Plant Click

unloading into the consumer-delivery vehicles.

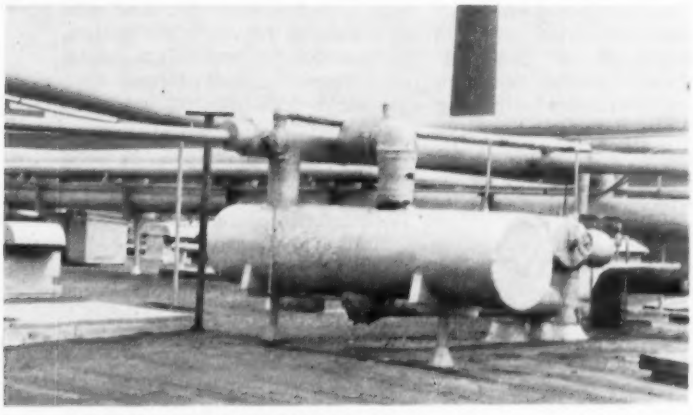
Since one man handles a whole cart-load, manpower savings have been won.

Missing from the production rooms—to the great satisfaction of everyone—is the usual maze of refrigeration pipes, with their ponderous layers of insulation.

Good Humor placed these lines on the roof—and with good reason:

Ceiling of the processing building is relatively low, hence inside installation of refrigeration lines would have created a very unsightly appearance. Further, they would have greatly restricted the space in the production areas, cutting down headroom and posing problems of equipment location.

None of these problems has to be coped with, thanks to the roof mounting.



ROOFTOP REFRIGERATION lines keep clutter out of plant, thus saving production-area headroom. Hazard from ammonia fumes is eliminated. And pipes are more easily maintained and repaired.

Moreover, the topside lines are easier to maintain, there being plenty of working area on the roof, with no production traffic. And ammonia leaks up there can't affect employees inside the plant.

Also, the insulation stands up better in the atmosphere. Inside, the covering would have had to withstand high humidities. The present covering—cork painted with asphalt, then wrapped and further painted—has been on 10 yr. with only routine off-season maintenance required. Such work is carried out during the winter, when production stops for six months.

In this Long Island area the state requires that all users return to the ground as much water as they take out. If this isn't done, sea water tends to seep in, augmenting corrosion factors and becoming a general nuisance.

An 80-ft. pipe handles the task of returning used condenser water. The pipe is equipped with a long screen which disperses the returned water over a large area, thus preventing a temperature rise in the ground water.

Packaging Problems Surmounted

Ice cream novelties are made up by this company in such a wide variety that standard packaging machines won't handle them all. Witness the many different kinds of sundaes and stick ice creams offered by Good Humor. Illustrative is the latest item—a "banana split" comprising chunks of banana, nuts, and fruit embedded in ice cream and covered with chocolate.

The forming and packaging of the many varieties has required special innovations on the part of the company. And noteworthy, here, has been the cooperation of equipment and material suppliers.

Company engineers contributed, for instance, in design of fillers that pack 3-, 4-, and 5-oz. sundaes in cups at 110 to 120 per minute.

They also fabricated a unit that spin excess chocolate from confections after dipping, thus assuring uniform coatings. In practice, the operator places a stick holder, with its supply of clamped-in freshly-dipped ice cream bars, on a special reel and gives it a quick twist by hand. Excess liquid chocolate is flung off, impinges on a cylindrical sheet metal housing, and so is recovered.

INTO FOREST AREA stream waste waters from Seabrook's huge vegetable-processing operations. Pumps, portable pipes, and irrigation-type spray nozzles are employed in efficient routine.

This woodland spray system

Disposes Billion Gallons of

BELFORD L. SEABROOK

Vice-President, Production, Seabrook Farms Co., Seabrook, N. J.

MANY ADVANTAGES—including several not initially anticipated—have been won by our successful experimentation with the disposal of waste water from vegetable-processing operations.

Employed here at Seabrook Farms Co., Seabrook, N. J., is a means of spray irrigation on wooded wasteland. And among the prime benefits —which also may accrue elsewhere when soil and subsoil characteristics are suitable—are these four:

1. **Enormous amounts of water sprayed on the surface are quickly purified as they percolate down to the ground-water table.**

2. **Underground runoff delivers pure water to adjacent streams.**

3. **When soil and aquifer structure permits, ground water storage can be increased in those areas where the available water supply is depressed due to heavy pumping.**

4. **The procedure may be extended, to a limited degree, to cropland spray irrigation during moisture-deficient periods, thus disposing not only of plant waste water but also materially increasing crop yields.**

Since the start of this project in 1950, the geologic and hydrologic aspects of this unusual operation have been investigated by the Ground Water Branch of the U. S. Geological Survey. This was in the belief that it would provide an exceptionally favorable opportunity for evaluating some poorly understood parts of the hydrologic cycle.*

Included by the Geologic Survey was a water-budget study of the irrigated woods, taking into account precipitation, water spreading, surface water runoff, ground water discharge into streams, evaportranspiration, and changes in ground water, surface water, and soil moisture storage.

The Survey's findings indicate that a method has been developed at Seabrook's for annually disposing of approximately one billion gallons of waste water derived from food processing operations by means of "woods irrigation".

Successful functioning of this system depends upon the local topography, geology, hydrology, soil, olimatic balance, and flora.

Further it may be concluded that unless there are significant changes in vegetation, soil conditions, or in

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Large nozzles spread effluent from big vegetable-processing operation. Flow quickly infiltrates ground strata, with purified runoff feeding adjacent streams. And cycle can be continued indefinitely . . . Cropland irrigation is a further function . . . Equipment detailed. Spreading-area capacity factors cited

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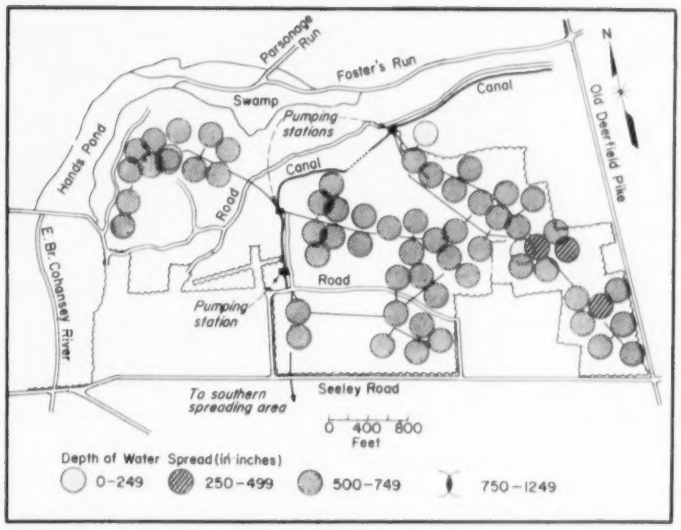
*It is to be further noted that many aspects of the spreading operation have been studied by Seabrook Farms Co. and The Laboratory of Climatology of the Johns Hopkins University under the direction of C. W. Thornthwaite. Also, much of the material presented in this article has been derived from the Geological Survey's open file report by Irwin Remson, titled *Hydrologic Studies at Seabrook, N. J.*



HIGH disposal performance is shown by map of spray areas (circles), indicating waste-water acceptance. Tract comprises 260 acres.

Waste Water Annually

the present schedule, which permits a "resting" or recovery period during the winter, it seems probable that the area can continue to be used indefinitely for the disposal of approximately one billion gallons of waste water annually.

Focus on the Operation

Here's how the spray-irrigation, water purification project was set up, how it operates, and some of the unusual results which may guide others facing the problem:

Each year, Seabrook freezes or cans approximately 90,000,000 lb. of vegetables, the produce from 50,000 acres of cultivated land farmed partly by the organization and partly by "contract farmers". The processing of this vast quantity of food requires the use of about a billion gallons of water per year.

The minimum water consumption during the winter is approximately 500,000 gal daily. However, during the harvest season the daily water use reaches a peak of approximately 10,000,000 gal. Similar to the experience of many industries, it is the disposal of this large amount of water after use, rather than its procurement, that posed our problem.

Disposal was attempted by spreading the water over a woodland tract by means of large irrigation nozzles. The waste water infiltrates the permeable sands of the area, is there subjected to biochemical action as it passes through the soil, and eventually appears in nearby streams as water of good quality.

In fact, a biochemical filtration process takes place. Aeration is achieved as the water passes through the air and in the top layers of "forest litter" on the ground. There is further purification as the water percolates down through the forest soil horizons to the water table.

Studies of the biochemical oxygen demands of water at different levels in the ground suggests that approximately 96% of the organic content of the water at the surface is removed within the first 4 in. of the surface. This and similar determinations were made by R. A. Webster, Seabrook sanitary engineer.

Two Wastes—Domestic and Industrial

Our liquid wastes fall into two general categories—domestic and industrial. For the first there is a fairly constant output at about 400,000 gal. per day throughout the year from the Seabrook Farms village. This sewage is treated fully at a modern sewage plant, giving an effluent of excellent quality. This is discharged into a nearby stream.

The nature and quality of the industrial waste water vary seasonally with the vegetable processing. During the winter slack period it is largely made up of refrigeration water of good quality that can be safely disposed of in surface streams.

However, from early April until mid-December, the plant effluent consists mainly of water derived from the washing and cleaning of vegetables.

This water is similar in quality to that in a domestic sink after garden vegetables have been washed and cleaned. As for the quantity, it varies with the season and with the crop being processed, but reaches peaks, as stated, of approximately 10,000,000 gal. per day.

After this industrial waste water is screened and chlorinated at the sewage plant, a gravity flow canal, 1.7 miles long, conducts the effluent to the spreading area, a woodland tract of approximately 260 acres.

So far, only 85 acres, scattered through the total tract, have been used as spreading area. Also, some of these acres have been abandoned as no longer necessary to handle volume requirements.

After the waste water reaches the spreading area, a battery of seven pumps (100 hp.) at three pumping stations forces the water from the canal through portable pipe lines to large rotating irrigation nozzles distributed through the woodland area.

According to the prevailing operation pattern, three nozzles on each line are run at the same time. On a time schedule, they are replaced by three different nozzles on the same line. Operated at pressures between 60 and 85 psi., the nozzles spread 22,000 gal./hr. of water over an area of approximately 1 acre each, a rate of slightly less than 1 in. per hr. As mentioned, the total during the first year was approximately one billion gallons.

Figured according to the whole tract (260 acres), the average was about 120 in. Of course, the areas under the individual nozzles—the actual points of application—received a considerably greater amount. Under some nozzles, the quantity exceeded 1,000 in. a year, and actually reached 1,200 in. in a few areas.

These figures are only approximate

and are included to give the proper perspective.

Some water is removed by evaportranspiration from the canal, from the nozzle sprays, from the foliage and litter, and from the soil. However, most of the water eventually reaches the water table.

A Look at the Layers

The elevations at Seabrook's rise from 65 ft. above mean sea level to about 120 ft. on some of the hilltops. In general, the surface soil in the spreading area is of a sandy nature underlaid by gravelly and sandy layers interspersed by small, perched island layers of impervious clay. Unconfined ground water saturates the lower portions of the sandy and gravelly layers.

Underlying this sub-soil makeup is a layer of clay sufficiently "leaky" for transmission of the waste water to the main reservoir below. This latter is a sand-and-gravel deposit resting on an impervious clay layer forming the aquifer's floor, which tilts at an angle of 11 ft. per mile toward the Atlantic coast.

Of prime importance to the understanding of the spreading operation and its success is knowledge of the disposal area's natural features. Pertinent here are the surface features, geology, soil and climate.

The surface features, or topography, of an artificial infiltration area are significant in several ways. The steepness of the slopes partly determine the amount of infiltration, run-off, and erosion that will occur. The streams—their density, location, and depth of incision—are critical because they are the ultimate channels through which most of the effluent will leave the area.

The topography largely determines the depth and configuration of the ground-water table and the location of the springs. Finally, the topography will help decide many of the engineering features of the project, such as the number and size of pumps, and the length of irrigation line.

The geology is important because it controls the movement of ground water and affects the entire ground-water picture. Furthermore, the geologic formations are the materials from which the soils are developed.

Of vital concern are the characteristics of the soils of any spreading-area project, because most of the biochemical filtration of the applied liquids occurs within the soil zone. Also they help to determine the infiltration rate.

In addition, the type and density of the vegetation, resistance to erosion, and chemical stability of the soil in relation to the applied water are largely dependent upon the type of soil.

In considering climate, it is obvious that precipitation will increase the amount of recharge to the water table, while evaportranspiration will reduce it. The temperature is important because of its effect on the rate of chemical and biological activity and on the rate of evaportranspiration. Cold water will cut down the infiltration rates, especially if it is accompanied by ice. The climate is also instrumental in development of the soil profile.

As would be expected, vegetation affects the water percolation-infiltration rate. In addition, striking floral changes result from our "tropical rainfall." These also affect the readiness with which water is absorbed in the spreading area.

Effect on the Forest

The original forest in the area consisted of mixed oaks and a ground cover of mountain laurel, low blueberries, blackberries, dogwood, and holly. After three years of irrigation, the ground cover had been replaced in a striking fashion by lamb's quarters, pokeberry weed, climbing hemp weed, elder, night shade, and other herbaceous plants. These, toward the end of the season, reach a dense, rank growth. Some of the plants grow to several times the stem thickness and rise to several times the height of the same plants in nearby areas that are not spray-irrigated.

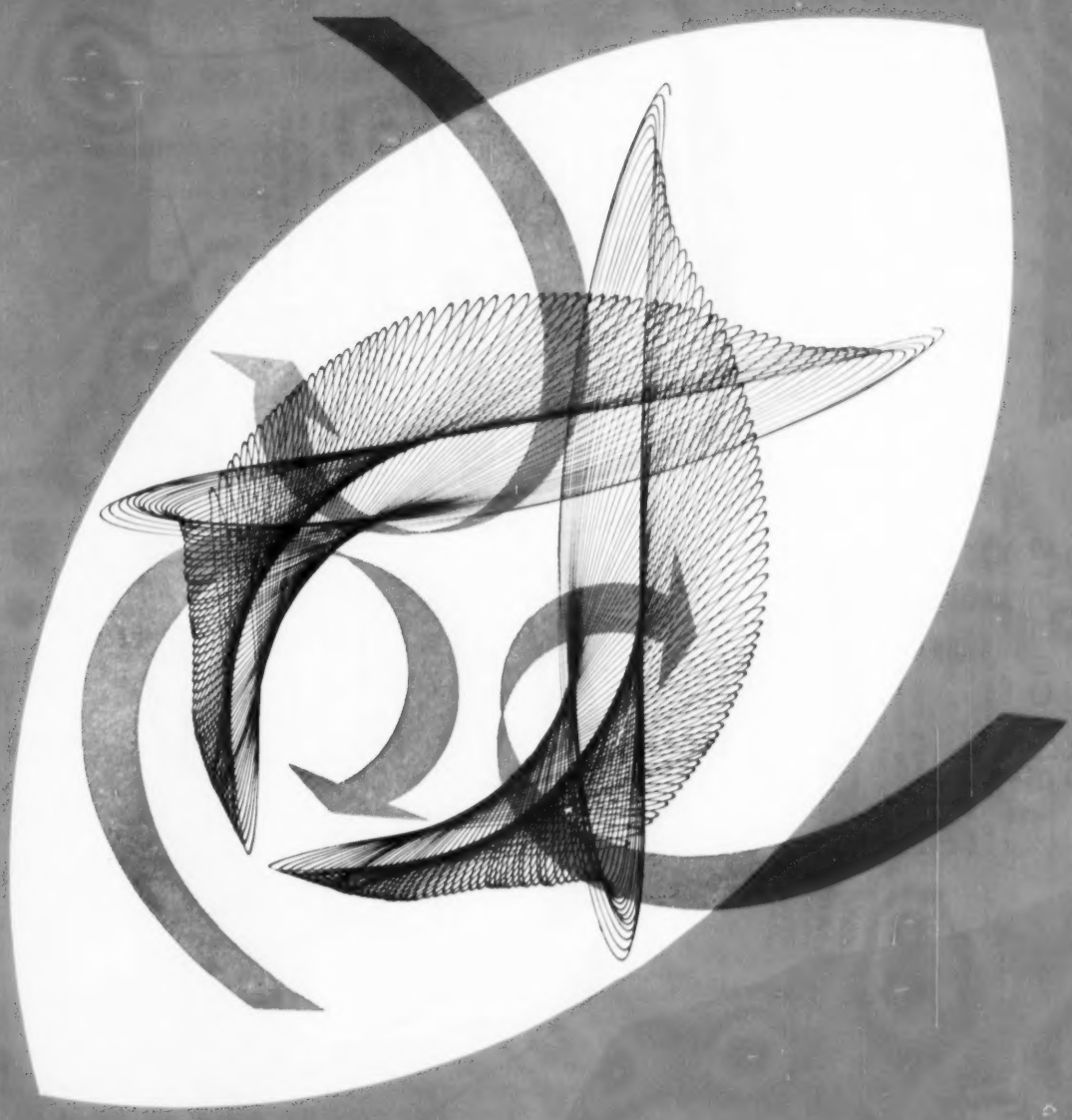
Current studies seek to find out whether the greatly increased rainfall will have a tendency to stimulate the growth of many of the trees, mostly oaks, in the area. Nevertheless, quite a few trees in the area have been killed—not as a result of the spray bombardment or the excessive rainfall, but because they are perched over clay "saucers".

In several areas these thin clay lenses are relatively close to the surface, where they effectively delay some of the water moving down to the principal ground-water body. One clay lens lies within 3 ft. of the surface, and water perched upon it drowned the roots of an impressive chestnut oak stand and so killed it.

In a typical soil profile within the area, the A_{00} layer, consisting mainly of recent accumulation of leaves, may or may not be present. The A_0 layer is approximately ½ in. thick and contains black organic matter. The A-1 horizon is about 5 in. thick and has a marked gravish color. It is made up of finely divided organic material mixed with grains of bleached white sand.

No B-zone, or clearly marked zone of alluviation, is discernible. This

THESE PUMPS draw waste from canal, send it through pipes to spray nozzles in woods. Seabrook uses three such pumping stations.



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CORN SYRUP SOLIDS

may be because the water moves downward in this permeable material too rapidly for precipitation of iron to occur. Therefore, the C-zone lies immediately beneath the A-1 zone. It has a fairly uniform tan-to-yellow color which is mainly that of the original geological material.

Areas under some of the nozzles accept and absorb the 8 in. of artificial precipitation per 8 hr. with no runoff. At other locations, some surface runoff leaves the spreading radius, but is absorbed immediately outside of it.

It is possible that the quality of the effluent charged with organic particles has tended to lower the infiltration capacity by depositing a black muck on the ground near many of the nozzles. However, the phenomenal growth of roots has helped to maintain or even increase the infiltration capacity in many areas.

Tests in a cultivated clover field gave an infiltration rate of 4.6 in. per hour. Although this may be thought a large rate, it is still considerably smaller than that for the soils in the woods.

The marked difference in infiltration capacities of tilled soils and untilled woodland is a well-known phenomenon attributable to several causes. The rate in cultivated soils is decreased by the presence of a plowsole. In addition, cultivation may affect the soil aggregate and the plant and animal structures and channels, which are responsible in a large part for the soil permeability.

Finally, tilling leaves the soil prey to the destructive effects of raindrop compaction and puddling, further lowering the infiltration capacity.

In the tilled fields, the soil profile is completely different, also the permeability. With the new water regimen in the spreading area, and with the accompanying changes in the position of the water table and the pH of the soil water, the profile described above may undergo some changes.

Under natural conditions in our crop or grass-covered fields, the winter rainfall supplies water in excess of the small needs, so that the annual winter water surplus of 37.8 cm. enters ground water storage or is removed by runoff.

Beginning in May, the greater requirement for water for the growing season exceed the amounts from precipitation. This deficit is first compensated by utilization of approximately 10 cm. of water, the estimated quantity stored in the root zone of the average soil at field capacity.

Toward the end of August, the stored water has been used, and the water deficiency of approximately 2 cm. per year begins to accumulate.

In October, the water need again falls, and a precipitation in excess of potential evaportranspiration begins to restore the assumed 10-cm. water-storage capacity within the root zone of the soil. By December, this has been accomplished, and the winter water surplus develops again.

Value in Crop Irrigation

Although the total average water deficiency is only 2 cm. for the year, there is a real need for supplementary irrigation. According to the computing methods used in these studies, moisture deficiency accumulates only after the entire soil moisture content has been depleted.

However, the crop begins to suffer at the start of depletion, and it suffers more and more as the soil water is removed. The term "invisible drought" has been used for this "insidious shortage of moisture in the root zone", which can cut crop output to 35% of potential.

Therefore, it is not only advisable, but really necessary to irrigate before the moisture content is below the optimum for plant growth. This results in the call for more irrigation than that indicated by the moisture-deficiency figure in the water balance outlined above.

Limited crop-land irrigation by nozzle spraying through periods of deficiency has increased crop yield to such an extent that approximately one-third of the waste water from our plant is now sprayed on crop land.

Even if the crop-land irrigation were extended to absorb the entire plant effluent, use of the woodland spreading area would still be necessary when rainfall is adequate for crop-land needs.

The nozzles used in the spreading area are extremely large. Since each covers an entire acre with 1 in. of water per hour, the evaporation-loss percentage for these nozzles is substantially small.

Our experiments indicate, however, that such losses can rise from 4 to 32% when using small-nozzle sprays (for crop irrigation) where each covers only 0.028 acre (0.5 in./hr. of water).

However, the relative evaporation losses decrease as the rate and volume of application increases, and also as size of irrigated area increases.

Early in our crop-irrigation experiment, it was found that any tilled land would become saturated and soupy to plow-depth after 2 in. of

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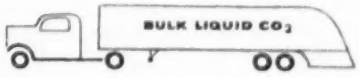

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water had been applied. At the same time, adjacent oak-pine woodlands that had not been plowed took 56 in. at the rate of 6.5 in./hr. without becoming saturated.

This particular penetration-test area received more than 150 in. in 10 days, with no sign of being satisfied.

In planning spray-irrigation applications, it must be remembered that while they are satisfactory for organic wastes, they may not be for inorganic, chemical, or other industrial effluent. For, if the chemistry of the percolating water is changed, the soil will attempt to readjust its profile.

Part of the readjustment might result in the deflocculation and disposal of clay colloids that were formerly held in aggregates. Such process could destroy the soil's permeability if carried sufficiently far.

The low clay content in our spreading-area soils makes danger of this sort remote. But it is a possibility that must be taken into account.

Ability to Take Water

Here, now, are the three factors that determine the capacity of the spreading area to dispose of large quantities of water: (1) Ease with which the water can get through the ground, (2) storage capacity available, and (3) ability of the underground material to transmit the purified water to springs and streams.

Our own large infiltration capacity indicates that the first factor is not likely to become limiting. Therefore, our disposal capacity will be restricted only by the storage capacity and to a greater extent by the transmissibility of the sub-surface geologic material.

Ability of the spreading area to absorb, store, and transmit water has not been exceeded at any time at Seabrook. With no changes in vegetation or soil conditions, our area probably can operate at the same spreading rate indefinitely, provided it is given the same period of rest for the decline of ground-water levels.

It should be pointed out, however, that a resting period may be important in any biological regimen that is responsible for removing the organic material from the water while still maintaining the soil infiltration capacity at a high level.

Woodland disposal of waste water from food processing has proved successful at Seabrook. And studies indicate that the same spreading area can be used indefinitely.

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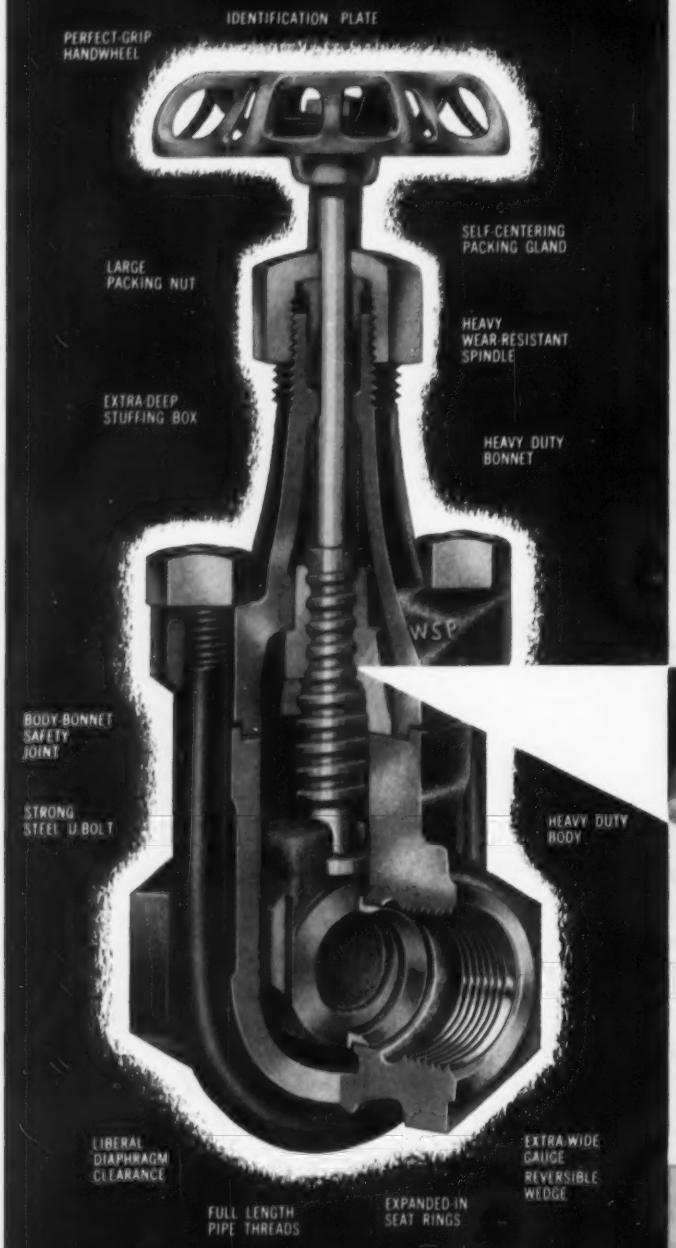

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Built right into a Jenkins U-Bolt Gate Valve are dollar-saving features no other can match. Construction superiorities that equip this valve to take punishment longer . . . saving dollars in replacement bills. Features that cut maintenance time and the cost of replacement parts . . . saving more dollars. For a good example, look at the unique Renewable Bonnet Saver Bushing which is a patented feature of Inside Screw valves.

BONNET-SAVER BUSHING

No need to junk a bonnet with worn operating threads. Just slip in a new bushing for good-as-new thread engagement . . . saving bonnet and lengthening spindle life.

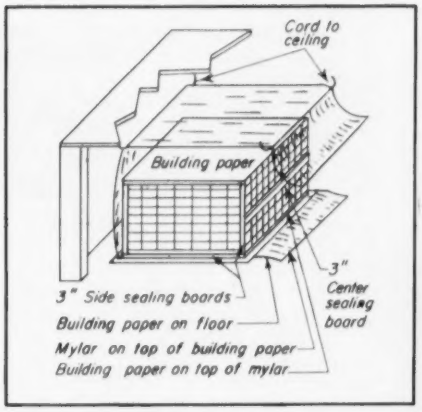
JENKINS VALVES

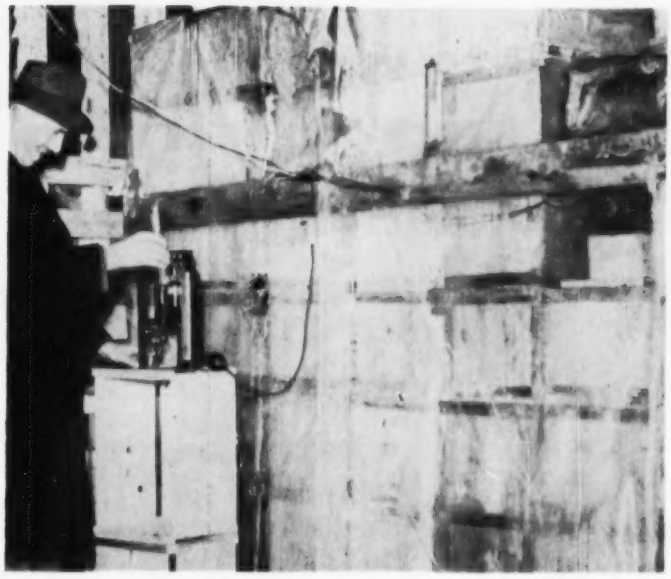
LOOK FOR THE JENKINS DIAMOND

JENKINS SINCE 1864

Jenkins Bros.

Sold Through Leading Distributors Everywhere


Cord to ceiling
Building paper
3" Side sealing boards
Building paper on floor
Mylar on top of building paper
Building paper on top of mylar
3" Center sealing board



MYLAR-ENVELOPE UNIT is simply constructed. Diagram gives details for enclosing block of fruit crates stacked on floor section. Note how ceiling cords support film. Photo (right) shows actual unit employed for apples. Researcher is checking CO_2 concentration.

Gas-Tight Plastic Storing Units—*Handy-Plus*

You can make them, readily and very reasonably, of such tough films as Mylar—convenient enclosures that are excellent for controlled-atmosphere storage of apples and other fruits

C. A. EAVES
Canada Department of Agriculture, Kentville, Nova Scotia

BY SETTING UP sealed areas and controlling the atmosphere within them, you can get very efficient performance in the storing of such commodities as fruits.

This type of warehousing is seen approaching its true all-around potential—now that new techniques using plastics have brought down the costs of the required installations.

Today, the new, thin, tough, gas-impermeable plastics—such as Mylar (du Pont)—make the economies possible. They are readily employed in constructing units having efficiency equal to that of conventional metal-lined rooms.

Specifically, we have found that the plastics open the door to the following improvements in fruit storage:

▶1. Flexibility in fruit size and variety, and number of boxes. Also, when a crop is "worked" over an extended period, the intervals required to fill and seal storage rooms may be varied to conform to the intermittent influx.

▶2. Avoidance of dry rot, which tends to develop in wooden structures due to locking of moisture between layers of insulation. (This results from the placing of gas-tight materials on the inner walls.)

▶3. Reduction of the per-bushel cost for materials and labor.

Ease of construction gives the plastic storehouses flexibility over large fixed-size rooms. A unit may be made to fit seasonal needs. Or several different sizes may be constructed within a standard cold storage room to conform to market demands, harvest time, and availability of fruit.

Cost of the units works out to about 4c. per bu. This is a notable economy, considering that the expense runs to 35c. for aluminum sheeting. Moreover, if the plastic is not mistreated, it should be usable for more than one season.

However, resistance to rodent action is, as yet, unknown.

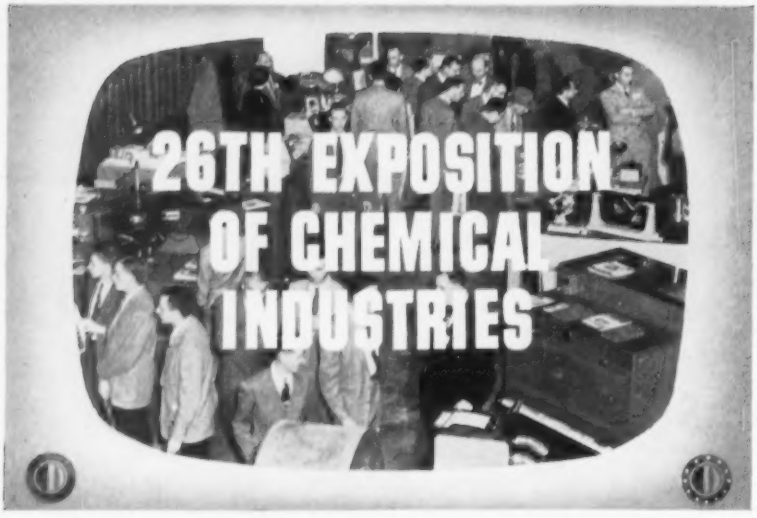
Even with a moisture layer on the inner surface, relative humidity runs at only 88-90%. And examination of a test lot of apples on Mar. 15 showed less than 1% fungal rotting and only slight core browning. The fruit retained good flavor and was reasonably firm (penetrometer readings of 11-12 lb.).

How Plastic Unit is Made

To make a storing unit, plastic sheets (Mylar) 0.01-in. thick and 50-in. wide are heat sealed (with the aid of benzyl alcohol) between 3-in. laps to form one piece large enough to cover top, bottom, front, and back of a stack of apple boxes. Smaller sheets are used for the sides. Overhangs of 2 ft. are allowed for joining.

The floor area is covered with heavy building paper (see diagram), and the master sheet is laid down so that there is enough plastic to cover the lower half of the front of the stack. A second sheet of paper shields the floor section of plastic, and another, atop the boxes of fruit, protects against any moisture that

The TIME and PLACE to see the top "program" serving the process industries



DEC. 2-6 – N. Y. COLISEUM

Here it is . . . the greatest concentration of new and important developments of vital interest to management, design, production and research personnel —all under one roof. It will pay you and your associates to see first-hand the more than 500 exhibits (4 floors) that will feature new methods, new processes, new products, new ideas, new ways to cut costs, increase production, and new ways to improve your products. This tremendous concentration of technical information will allow you to view, judge, and compare the latest advances in chemical materials, machinery and equipment. Specialized sections of laboratory apparatus and supplies, and chemicals and raw materials have been arranged for your convenience.

There is no quicker or more effective method of acquiring new ideas and valuable information than a few days spent at this exposition. The advantages to you and your company will be a profitable investment.

Reserve time and place now on your calendar.

26th EXPOSITION OF CHEMICAL INDUSTRIES
NEW YORK COLISEUM, DECEMBER 2-6, 1957

For advance registration, write to
International Exposition Company, 480 Lexington Ave., New York 17, N. Y.

might collect on the plastic ceiling. This paper should be moisture- and odor-proof.

A sealing surface is made by nailing smooth boards (3-in. wide) to the boxes on the four edges of each side of the stack, and one horizontal board half way up the front.

The required gas concentrations of 7% CO_2 and 14% O_2 are maintained by ventilation through a 4x4-in. port at the base of the store. The port's outer edge is coated with petrolatum jelly, and a piece of aluminum foil is used to adjust the size of the opening. The gas-holding property of the plastic is not affected by folding or crushing.

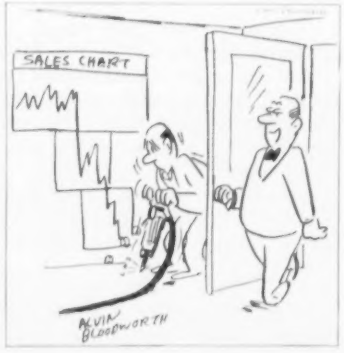
Finally, our studies delved into performance comparisons. We found (see table below) that there was faster accumulation of CO_2 in the Mylar envelope than in either Mylar- or metal-lined rooms. This is mainly attributed to the small free air space inside the envelope. To get oxygen concentration from this table, subtract value shown for CO_2 from 21%.

Percent CO_2 Accumulation With Different Construction and Capacities

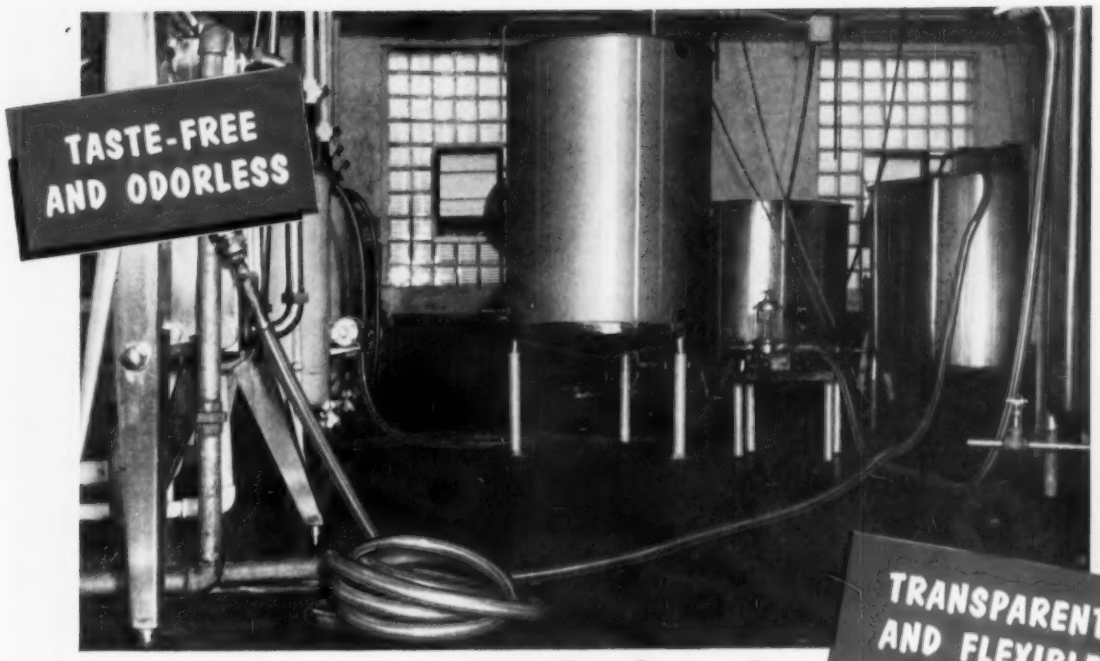
Days After Sealing	Mlyar 38F. (500 bu.)	Mylar-Lined 39F. (8,000 bu.)	Metal-Lined 39F. (5,000 bu.)
1	0.0	0.0	0.0
2	7.0*	2.0	4.5
4	12.0	6.5	6.2
6	7.0	7.0	7.6*
8	5.0	7.5*	7.8
16	6.5	6.5	7.5

* Ventilated

The above article is designated by the Canada Department of Agriculture as Contribution No. 895 from the Horticulture Division, Experimental Farms Service.



"Well, now — how's my new merchandising system doing?"



TYGON B44-3

food and beverage hose

The Golden Age Beverage Co., Inc., of Akron, Ohio, franchised bottlers and distributors of Pepsi-Cola, use Tygon Formulation B44-3 Transparent Flexible Plastic Tubing extensively in their Pepsi-Cola operation. Liquid sugar and syrups are piped to process vats, prepared mixes are pumped to storage tanks . . . all through 2″ i.d. x 2½″ o.d. Tygon B44-3 Food and Beverage hose.

Tygon B44-3 Tubing was chosen for this operation because of its many outstanding advantages over other piping mediums. For example, because it is non-contaminating and totally inert to food acids and alkalis, there is no possibility of flavor taint or odor resulting from its use. Its glass-like clarity enables operators to visually check contents at any point.

Tygon B44-3's flexibility makes it adaptable to any layout. It can be used in long continuous runs without extra joints or couplings, and if desired, hoses may be interchanged or simply moved from one application to another. The highly polished bore permits fast, thorough cleansing—Tygon lines may be uncoupled, washed or steam flushed — and be back in service in minutes. Fifty-five bore sizes from 1/16″ to 3″ i.d. insure a size for every need.

Consider for a minute how taste-free, odorless, transparent flexible "piping" can benefit your operation . . .

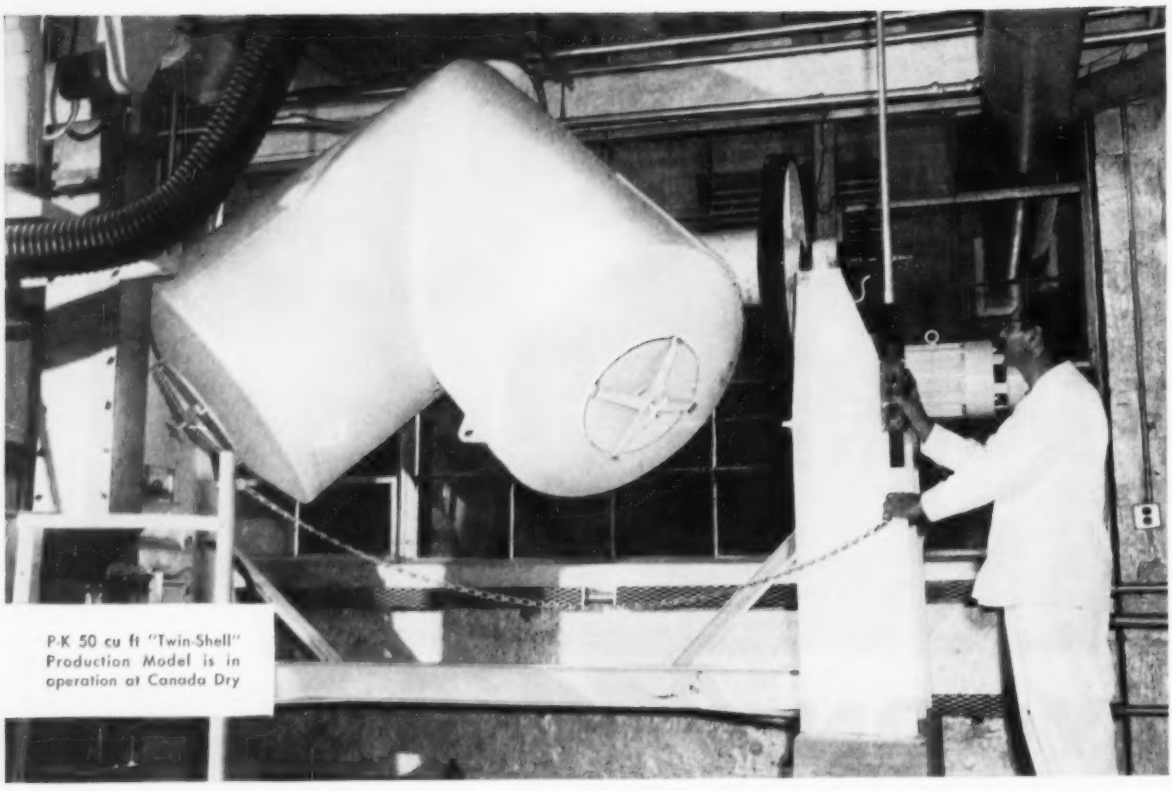
Send for Bulletin T-97. It's yours for the asking and gives the complete story on Tygon B44-3.

Plastics and Synthetics Division

U. S. STONEWARE
AKRON 9, OHIO

365E

For more data, circle this page number on card at back →



P-K 50 cu ft "Twin-Shell" Production Model is in operation at Canada Dry

Blending efficiency of P-K "Twin-Shell" Blender proven with Pre-Test by Canada Dry

Before buying a blender to produce large batches of dry sparkling water solids, quickly and uniformly, The Canada Dry Ginger Ale Co., Inc. arranged to pre-test the beverage powders in a P-K "Twin-Shell" lab blender. On the basis of the pretest results, Canada Dry ordered a 50 cu. ft. stainless steel "Twin-Shell" production blender with the specification that blending performance must be as good as that of the lab unit. (Scale-ups from lab tests are always equalled or bettered in P-K production models.)

Canada Dry now blends 1800 lb batches of dry sparkling solids in 20 minutes. This batch is approximately 12 times the batch size achieved formerly. The much larger batch allows Canada Dry to utilize available manpower elsewhere in the plant for most of the day's processing, since one 20-minute batch is sufficient for more than a day's requirements.

Because of the alkaline nature of the ingredients stainless steel was specified throughout. Cleaning is simple. The unit is cleaned with water at 200F.

Test *your* formulas free at P-K's Customer Service Lab

Leading companies in virtually all the chemical and food industries have found that P-K "Twin-Shell" blenders have met their blending requirements better . . . faster . . . and more economically than conventional mixer-blenders.

P-K can help you to determine accurately the right type of "Twin-Shell" blender for your needs. Complete lab facilities are available for blending materials from 4 qts to 3 cubic feet (working capacities)—comparison tests can be made on the spot. You and your staff can conduct your own blending studies . . . or you can utilize P-K's qualified blender technicians to assist you in product research. This service is available without obligation because P-K recognizes that more and more companies realize the importance of pretesting before purchase—they realize too, the need to keep their present blending methods up-to-date. If it is impossible for you to conduct these tests personally, arrangements can be made for you to send us your formulations for testing. In either case, contact Russell Dotter at P-K.

For technical data on P-K "Twin-Shell" blenders for production or laboratory use, write for bulletins 15a-1 (lab) or 15 (production). The Patterson-Kelley Co., Inc., 2011 Hanson Street, East Stroudsburg, Pa. Phone: 820.

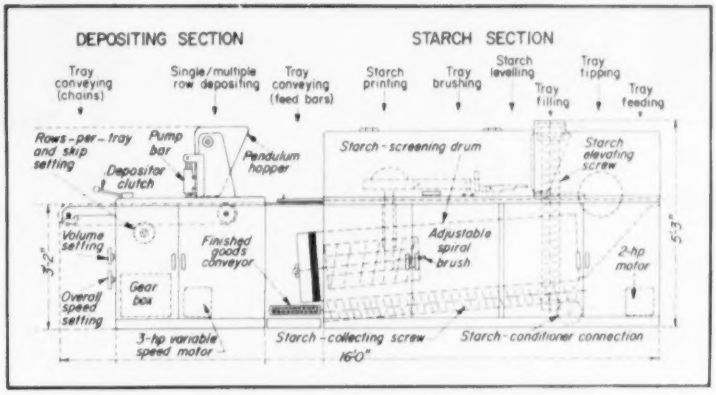
All P-K "Twin-Shell" Blenders are patented and the name registered.

15

Patterson Kelley

Chemical and Process Division

P-K "Twin-Shell" Blenders • Heat Exchangers • Packaged Pilot Plants • P-K Lever-Lock Doors • P-K Vacuum Dryer Blenders • P-K Cone and Ribbon Blenders



How Compact Unit Gives Top Performance

Full trays (entering at right) are turned 360 deg. to empty starch and dried goods. Latter are brushed and conveyed out, while starch is screened, aerated, and recirculated to filling hopper. Empty trays travel on for starch filling, imprinting, and depositing.

Cuts Starch-Molding Costs

New high-speed machine takes less money, space, and labor to own and operate

F. ROSE

Industrial Consultant, Toronto, Canada

NEW CURE for many of the old starch-molding headaches has come in from Australia. It's a midget automatic machine that does all the work of much larger units.

And here's what really has confectioners gaping. This molder does it faster and more accurately—and with considerably less capital outlay, supervision, and maintenance.

Our diagram shows the 5-ft.-wide unit's self-contained starch and depositing sections, dimensions, and operating cycle. Here are some of its outstanding features—

Starch Section: Tray tipping is a gentle, continuous slow motion that curbs damage to goods, also prevents raising of starch.

Rotary screens and brushes provide large surface for efficient cleaning. Brushed goods leave unit on integral wire-mesh conveyor.

V-shaped trough with screw continuously circulates the starch, permitting startup and operation with only five tray-loads.

Paddle-blade fan loosens and aerates the starch as it is returned to filling hopper by a chainless elevator. Result: Up to 20% less starch used per tray.

Jolt-free harmonic motion of trays' feed bars permits perfect starch printing.

Depositing Section: Special pendulum hopper assures tail-free deposits because nozzles follow imprints on moving trays, even after flow has been cut off.

Single handwheel control for rows-per-tray and skip settings provides centralized adjustment of entire machine for each product.

Volume control, which is independent of stroke-length adjustment, compensates for wear in linkages, piston head, and seals, also for any change of gravity head in the pendulum hopper.

Variable speed control permits depositing 50-90 single or multiple rows per min.

Multi-row pump bars enable high tray speeds. Staggered-row deposits boost output. And double depositors permit two-color and concentric shell-and-center work.

All parts of unit are easily accessible for cleaning, and none takes more than an hour to replace.

Cantab Industries, Inc., Toronto, Canada, represents the machine's builder, N.I.D. Products, Chippendale, N.S.W., Australia.

KLENZADE

COMPLETE SANITATION PROGRAMS For All Food PROCESSING PLANTS

★ Tops for Tough Cleaning Jobs

Klenzade "CBS" Cleaner is the finest industrial detergent available. Superb balance and high wetting agent content provide excellent soil penetration, fat emulsification, and free rinsing.

★ High Temperature Cleaning

Klenzade Flash-Kleen is ideal for steam cleaning jobs. Strips "baked-on" soil residues quickly with the Klenzade Steam Cleaner.

★ Controlling Mineral Deposits

Klenzade Flash-Klenz removes and prevents lime film on canals, troughs, fillers, chutes, etc. Use the Klenzade Alternate System of Cleaning employing alkaline and organic acid detergents.

★ Chlorine Sanitization and Water Treatment

Use Klenzade XY-12 Liquid Sodium Hypochlorite for thorough fast action. Control-packaging in ready-to-use solution. No predissolving — no "pin-point corrosion." Choice selection of chlorine application equipment.

Plant Sanitation Surveys On Request

KLENZADE

"ALL OVER AMERICA"

KLENZADE FIELD SERVICE

A Klenzade field service technician will gladly call on you and help you plan a complete plant sanitation program.

KLENZADE PRODUCTS, INC.

Offices in Principal Cities

BELOIT, WISCONSIN

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"We're solving our packaging problems with self-sealing Presseal cartons..."

Says Larry Robinson, president of Lawrence Robinson and Sons, seed specialists. "Time saving, labor saving Presseal is a major factor in our streamlined packaging program."

You, too, can solve packaging problems with

PRESSEAL

. . . the modern, easy-to-use carton which completely eliminates taping, gluing, stapling and other sealing methods. Factory-treated PRESSEAL carton flaps adhere together with the pat of a hand, but these same flaps will not stick to other surfaces.

If you're packing in corrugated cartons, you'll be packing better with PRESSEAL!

For Information on

PRESSEAL®

Write to

GROWERS CONTAINER CORPORATION

PLANTS IN SALINAS AND FULLERTON, CALIFORNIA AND JACKSONVILLE, FLORIDA

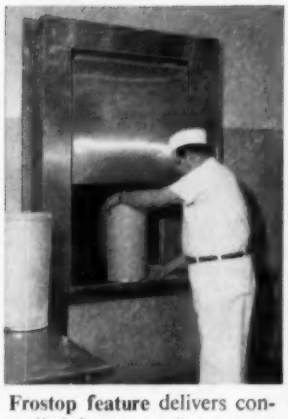
HEADQUARTERS in SALINAS, CALIFORNIA
SALES OFFICES — CALIFORNIA: Salinas, Fullerton, San Francisco, San Jose, Santa Rosa, El Centro, Fresno • FLORIDA: Jacksonville, Tampa, Miami Springs, Orlando • ARIZONA: Phoenix • LOUISIANA: New Orleans • GEORGIA: Atlanta ILLINOIS: Chicago • ALABAMA: Birmingham • SOUTH CAROLINA: Greenville

To accelerate production and streamline operations, the Harwill Ice Cream Co., Cleveland, Ohio has installed two of Jamison's new Power-Operated Vertical Sliding Doors that save space and refrigeration.

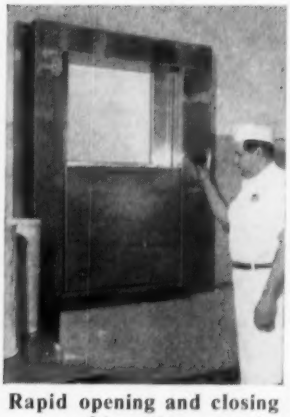
Jamison doors set the pace in modern handling methods . . .

Fast opening and closing doors now make it possible to incorporate production line techniques into various handling operations. Gleaming stainless steel provides easier cleaning, promotes greater sanitation.

Modern Jamison Cold Storage Doors are designed to solve problems in all types of installations and are available in many types and sizes. For quick, practical help with your problem, contact Jamison today.



Frostop feature delivers controlled heat to gasket contact area to prevent freezing shut.



Rapid opening and closing saves refrigeration, permits quick pass-through.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

JAMISON
COLD STORAGE DOORS

For more data, circle this page number on card at back →

There's MORE from Allis-Chalmers MOTOR distributors

Complete Motor Line

multi-speed

wound-rotor

face mounted

open

dc series wound

squirrel-cage

vertical solid shaft

totally enclosed

synchronous

vertical hollow shaft

drip-proof

foot mounted

splash-proof

"Synduction"

explosion-proof

dc compound wound

dc shunt wound

flange mounted

gear motors

. . . plus quality and service

As part of a national network of more than 200 franchised outlets, your nearby Allis-Chalmers Motor Distributor offers the rare combination of *fast service* and a *complete line* of *fine-performance* integral horsepower motors. He's the right man to give you just the right motor — in a hurry.

It adds up to:

1. Simplified Buying — Here's one source for all motors from 1 to 200 hp, as close as your telephone. Single source trims clerical costs, minimizes purchasing and accounting expenditures.

2. Reduced Inventory — You don't have to tie up funds and warehouse space with spare motors and replacement parts. The A-C Distributor is your motor storehouse.

3. Continuous Production — Your A-C Distributor can deliver a motor to your shop in a matter of hours. (And, once you order an A-C motor, you're sure of 'round-the-calendar operation.)

GET ACQUAINTED with your Allis-Chalmers Motor Distributor soon. You can find out his name by contacting the A-C sales office in your area, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Synduction is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5187

KEEPING UP WITH THE FIELD

Work Stress Instead of Diet Seen Guilty in Heart Ills

New medical research indicates that the stresses of daily work life are primarily responsible for the mounting cardiac disorders—rather than fats in the diet.

Bringing the closer focus on the question are recent comprehensive tests of a group of accountants working under heavy modern business pressure.

It was found that cholesterol in the blood increased notably when the accountants labored under stress. Further, the blood's tendency to clot rose in the periods of pressure—particularly significant, since the common cause of heart attacks is blocking of arteries by blood clots.

The studies were carried out by Drs. Ray Rosenman and Meyer Friedman of San Francisco, who reported the tests to the American Heart Assn.

Vs. Moist Bakery Packages

Seven tips on reducing condensation inside baked-goods packages are spotlighted by the Waxed Paper Merchandising Council:

1. Avoid wrapping at over 100F., 2. store wrapped goods at room temperature, 3. deliver in heated trucks, 4. bake slightly longer during very cold weather, 5. use innerwrap when you note condensation inside package, 6. don't bake goods having more than 38% moisture, and 7. don't wrap goods too tight or too loose.

Turns Whey Into Yeast

Promising possibilities of using whey wastes from cheese operations to grow yeast, thus solving a disposal problem, are now pointed out by EURDD researchers.

The report states that the process results in formation of new cells from whey elements, leaving a liquid that passes easily through regular sewage systems.

Sweet Fruit Gets the Vote

Despite diet fads, Americans still prefer their canned fruits on the sweet side.

U. of Calif. researchers report their surveys consistently show consumers like more sugar in the pack than currently offered. In fact, people who can at home use more sugar.

Taking this cue, several West Coast canners have put up experimental packs of cling peaches with 50% more sweetening.

Group Activates Automation

To help meet the challenge of instrumentation to food manufacturers, the embryo Food Industry Committee of the Instrument Society of America is expanding its activities.

Headed by J. B. Anderson, who directs the engineering research department at Heinz, it will sponsor convention sessions on automation and otherwise disseminate information on progress and problems in food-process instrumentation.

New AMA Training Center

A striking $2 million facility for resident training of business executives has been opened by American Management Assn. at Saranac Lake, N. Y. Called the Academy of Advanced Management, the center comprises a 90-acre layout of buildings in Adirondack State Park.

Dairy-Course Roundup

Short courses and dairy conferences are slated at the following universities and colleges during the coming months:

Michigan S. U.—Dairy Engineering, Feb. 25-26, 1958; North Carolina State—Fieldmen & Sanitarians, Nov. 25-26, 1957; Ohio State—Market Milk Correspondence Course, Oct. 15-Mar. 14, Ice Cream Short Course, Jan. 6-17, Dairy Tech Conference, Feb. 25-28, Milk Sanitarians, Mar. 17-21; Penn. State U.—Tank Weighers & Samplers, Nov. 11-15, 1957, Soft Ice Cream, Dec. 2-6, Testing Dairy Products, Jan. 6-11, Ice Cream for Plant Men, Jan. 13-25, Market Milk & Supervision, Jan. 27-Feb. 8; Texas Tech. College—Dairy Ind. Short Course, Nov. 13-15.

Speedy Tie-In

—with man's first out-of-this-world venture, entitles Leaf Brands, Inc., Chicago, to the blue ribbon for enterprise. Its new Sputnik bubble gum—featuring an outer-space wintergreen flavor sealed in a soft coating that the company describes as an "asteroid finish"—has quickly rocketed to favor with the younger element. Credit for the box design goes to Chicago Packaging Consultant Barry Nolan. Meanwhile, initial box of the confection is on its way to Nikita Khrushchev—sent to him by Leaf "in the spirit of the International Geophysical Year."

Too Little Data on Fallout vs. Food Materials

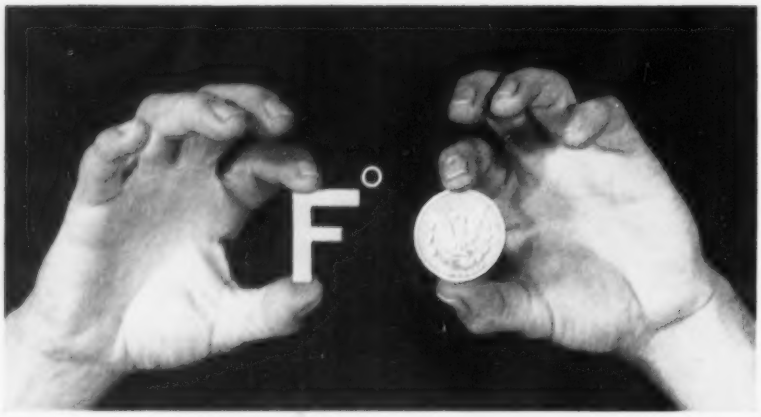
"Disappointing"—that's the preliminary word on the tests to learn atomic-fallout effects on exposed food products and wrapping materials.

FDA had planned several exposures, but it had to call things off when funds were cut June 30. Analyses continue, but results show a scarcity of data.

However, the 18 types of packaging materials exposed, ranging from burlap to cellophane, did show a close correlation between roughness of texture and retention of radioactive materials. Smooth-surfaced plastics showed little or no contamination.

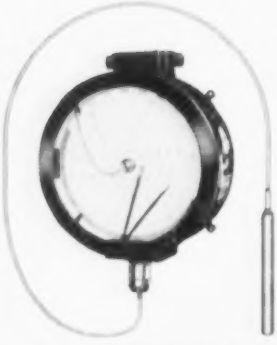
The same materials attracted more contaminants when dirty or greased than when clean. But even heavily soiled cellophanes measured less radioactivity than unsoiled burlap.

Results will be published, subject to Atomic Energy Commission clearance, late next year.



DEGREES MEAN DOLLARS

Partlow Temperature Indicating Control



Partlow Temperature Recording Control

Partlow's "pinpoint control" of degrees saves processing dollars

Partlow Controls are protecting materials and equipment in more and more processing operations where maintenance of accurate temperatures is vital.

Available in recording, indicating and non-indicating models, they provide positive, precise temperature control for processes using either gas, oil, steam or water valves, or electrical equipment.

Partlow Controls have a reputation for dependability and long life. Actuated by mercury, they are ruggedly built to withstand shock and vibration without loss of accuracy. Many have been in service for 20 years or more.

Available in ten scale and element ranges, from –30°F. to 1100°F.

Tell your process problems to Partlow. Our Engineers will gladly work with you.

partlow

THE PIONEER IN MERCURY THERMAL CONTROLS

MAIL THIS COUPON TODAY

THE PARTLOW CORPORATION

Dept. F-1157, 2 Campion Road, New Hartford, N.Y.

We are interested in Partlow Controls for the following applications:

_____

_____

☐ Have representative call. ☐ Send us data on Partlow Controls suitable for applications described above.

Company _____

St. & No. _____

City _____ State _____

Signed _____

Pectin-Like Glaze Guards Quality of Frozen Foods

Processors are showing keen interest in a new Norwegian food-freezing technique said to curb oxidation and loss of natural taste and color.

Products, such as mackerel and mullet, are first glazed with a special seaweed-derivative jelly (Protan) that virtually seals them from air, thus boosting shelf-life.

The water-soluble jelly, which is FDA-approved, also cuts freezing time up to 25%. Successful tests with peeled shrimp and strawberries indicate wide application for the method.

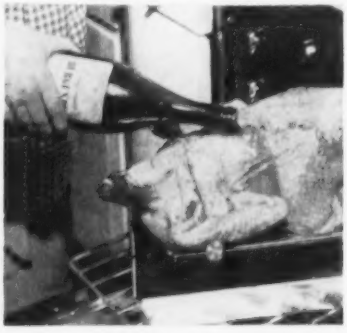
Meanwhile, 14-oz. packs of frozen mackerel are being successfully retailed through leading U.S. supermarkets, according to Ramfjeld & Co., New York City, sole importer. And Horn & Hardart is using the institutional pack (4 lb. 6 oz.) in its New York restaurants.

New Cream Keeps 6 Mo.

A sweetened cream product having half-year shelf-life at room temperature has been unveiled by USDA —and bids fair to open an important new market.

Used in coffee, it "doubles" as a sweetener. It's suitable for making ice cream and whipped cream.

Comprising 40% butterfat, additional nonfat milk solids, and a concentrated sugar solution that retards bacterial growth, the product may be made by any well-equipped dairy. Public service patent has been applied for.



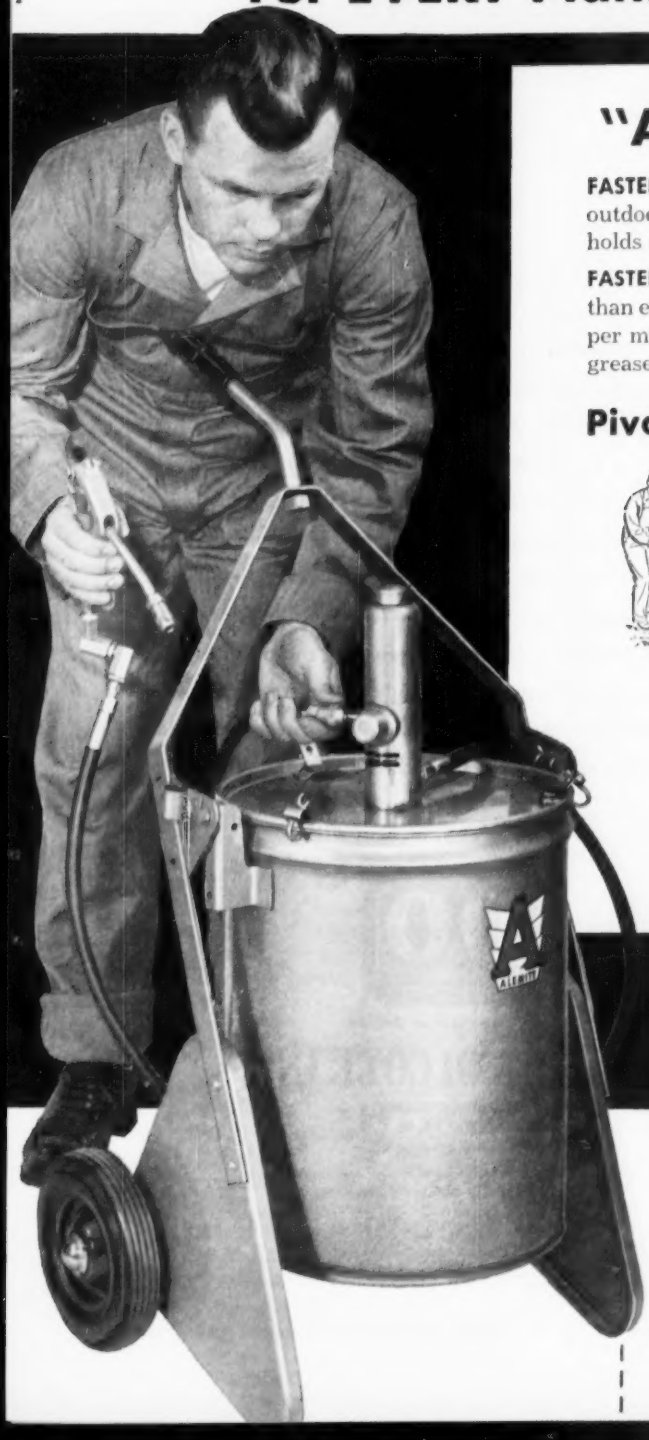
No—Not THAT Way!

Heralding Thanksgiving is the suggestion by Wine Institute, San Francisco, that basting the bird with red table wine will give the succulent meat an extra-special flavor. Cook in this photo goofed—applying the "direct method" before waiting to hear the recipe (which calls for ¾ cup warm wine combined with ¼ cup melted butter or margarine).

Roll It Anywhere for Fast High-Pressure Service!

ALEMITE PORTABLE POWER GUN

For EVERY Plant Lubrication Job!



"AIR-POWERED 711-A"

FASTER—because it's easier to handle! Saves lubrication time outdoors or indoors—anywhere in the plant. Pivot-swing dolly holds container upright at any pulling angle.

FASTER—because exclusive, newly designed pump packs more than enough power for every job. Delivers 14½ oz. of gun grease per minute at 70°F. Holds 25-, 35-, or 50-lb. pail—or 70 lbs. of grease. Dynamic primer assures positive priming.

Pivot-Swing Dolly For Easy Moving...

Over rough ground!

Up and down steps!

Over rough floors!

Electric-Powered "Porta-Kart"

Only 18" wide. Easily moves through narrow aisles. Capacity, 12 pounds. Delivers 13 oz. of pressure gun grease per minute. Automatic switch shuts off motor when 5,000 lbs. of pressure is built up. *Model 7182-B.*

Step up to modern, time-saving lubrication methods! Check Alemite's complete line of air-powered and electric-powered lubricators.

ALEMITE
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Division of STEWART-WARNER CORPORATION

MAIL COUPON FOR FREE CATALOG!

Alemite, Dept. S-117, 1850 Diversey Parkway
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Please send me your complete catalog on Alemite lubrication equipment for industry.

Name_____

Company_____

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City_____ Zone_____ State_____

IN THE CHANGING WORLD OF FOOD

Desserts

MUST BE FAST AND FLAVOR-FUL!

There is no more important item in the gleaming cabinets of a modern kitchen than the varied array of powdered desserts! Gelatines...puddings...pie fillings...icings, today are a "fait accompli" in a matter of moments. And, thanks to "spray-dried" flavors, the taste-appeal is superb! DOLCOSEAL flavors for powdered desserts — part of D&O's extensive line of spray-dried products — can be counted on to deliver their original, true, fresh flavor even after extended shelf life. Specially processed to preserve all flavoring qualities, thoroughly tested in finished products, and competitively priced, they are available in a complete selection of flavors. For spray-dried flavors that guarantee results — try DOLCOSEAL. Trial quantities on request.

Essentially for You

D&O
ESTABLISHED 1798

OUR 159th Year of Service

DODGE & OLCOTT, INC.

180 VARICK STREET
NEW YORK 14, N. Y.
Sales Offices in Principal Cities

Essential Oils, Aromatic Chemicals, Perfume Bases, Flavor Bases, Dry Soluble Seasonings

Write for copy of "The Changing World of Food"

Speeds Beef Freezing

Less processing time and better product quality are promised by recent British experiments in freezing beef quarters.

By-passing the conventional 2-3 day chilling period, the quarters under test went direct from slaughter house floor to blast-freezing tunnel, where they were quick-frozen at —40F. in air moving 1,000 fpm.

Resulting quality was good. And "drip" (fluid from thawed meat) was reduced.

The studies are reported in *Food Investigation 1956*, available from British Information Services, New York City (postpaid charge: 68¢).

BRIEFLY

• WORLD FOOD SHORTAGE threats may be lessened through winning longer storage life by irradiating foods. So stated Drs. C. Metta and B. C. Johnson, U. of Ill., in a cent paper presented before the American Chemical Society.

• PROMOTING SAFETY pays off —latest proof being a report from the National Assn. of Refrigerated Warehouses. Since 1952, drives against mishaps have cut member-plant accident frequency rates 20%, and work days lost have dropped more than 45%.

• INCREASED EARNINGS are reported by General Foods and Consolidated Foods. For 6 months ended Sept. 30, former showed rise to $23,811,000, a $381,000 up from same period a year ago. Latter's earnings for first fiscal 8 weeks ended Aug. 24 were $576,872. This was $170,074 over '56 period.

• DEHYDROFROZEN PEAS have proved highly acceptable to both restaurant owners and patrons in a test made in 100 establishments in Milwaukee. Saving in freezer space and ease of preparation were cited by owners, while customers found the product excelled in flavor and appearance even after a considerable time on the steam table.

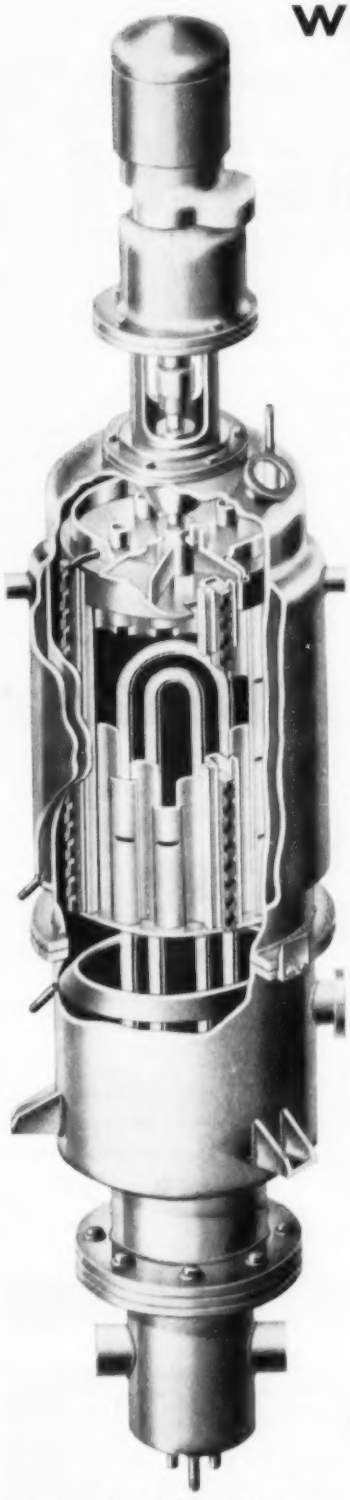
Action on Standards

Following actions have been taken by the Agricultural Marketing Service (AMS) and Food & Drug Administration (FDA) on U. S. Standards and also on allowable tolerances of various pesticides on raw agricultural commodities. References are to the *Federal Register*.

Orange juice, concentrated, AMS

Want to evaporate foods faster

without ruining their flavor?



Cut-away view of Wiped-Film Evaporator illustrates unique action of floating teflon wiper blades which quickly spread uniform thin product film over evaporating area.

Look then to Pfaudler and the wiped-film evaporator.

This unique new machine spreads your product in a very thin, uniform film which promotes higher heat transfer and faster evaporation.

A floating teflon blade acted upon by centrifugal force sweeps the product around the peripheral evaporating surface while under constant vacuum.

The entire design works to keep your product evaporating almost instantaneously so there is little or no chance for thermal decomposition which might change flavors or otherwise harm product quality.

Because it is so efficient in its heat transfer and fast feed-through, the wiped-film evaporator may well answer your need for lower processing costs.

Lab and pilot plant models available

Test your own product in either the 2-inch lab model or the 12-inch diameter pilot plant model. When you are ready for full production we can supply units from 4 to 100 square feet of evaporating area.

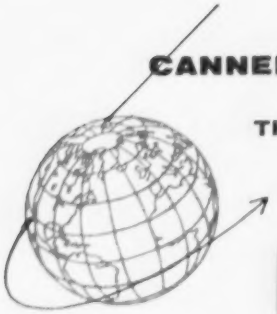
Check the coupon for complete technical data on the Wiped-Film Evaporators and other integrated process equipment for the food industry by Pfaudler.

THE PFAUDLER CO.
a division of PFAUDLER PERMUTIT INC.
Dept. FE-117 Rochester 3, N.Y.

Please send bulletins on ☐ Wiped-Film Evaporators ☐ Heat Exchangers ☐ Tanks—Mixing and Storage ☐ Centrifuges ☐ Conical Dryer-Blenders ☐ Rotary Piston and Gravity Fillers.

Name .....
Title .....
Company .....
Address .....
City .....
Zone ..... State .....

For more data, circle this page number on card at back →



CANNERS AND CAN MAKERS

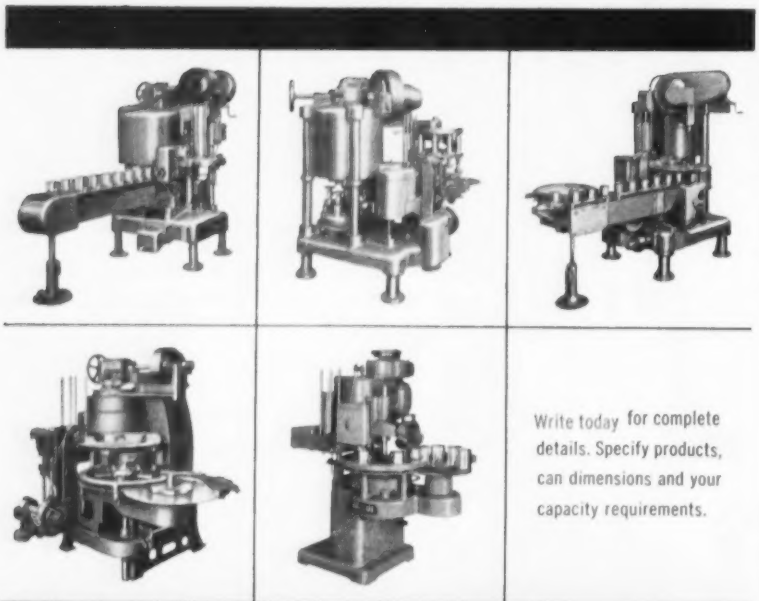
THE WORLD OVER

ARE SWINGING TO

ANGELUS

CAN CLOSING MACHINES

Through simplified design, ease of operation, ruggedness, and a wide range of accessories designed for quick low cost change over, Angelus Can Closing Machines give you these essentials for more efficient operation—LOWER FIRST COST—LOWER MAINTENANCE—HIGHER PRODUCTION. The complete line of Angelus seamers with their wide range of accessories meet every round can closing requirement for any type of product, liquid or solid, from 30 up to 500 cans per minute Angelus, with over 45 years of specialized experience, is the nation's only manufacturer exclusively producing automatic round can closing machines.



Write today for complete details. Specify products, can dimensions and your capacity requirements.

ANGELUS

Sanitary Can Machine Company

Cable Address "Angelmaco" Western Union Code

1900 Pacific Boulevard • Los Angeles 58, Calif.

Schedule of Events

November

17-21—Master Brewers Assn. of America, annual convention; Hotels Fontainebleau & Eden Roc, Miami Beach, Fla.

18-21—Air Conditioning & Refrigeration Exposition; International Amphitheater, Chicago.

December

2- 6—Exposition of Chemical Industries; Coliseum, New York City.

13-14—Peanut Butter Mfrs. Assn., annual meeting; Congress Hotel, Chicago.

14-16—National Food Brokers Assn., annual meeting; Conrad Hilton Hotel and Palmer House, Chicago.

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notice of amended U. S. Standards, *F. R.*, Sept. 18, p. 7428.

Onions, canned, AMS notice of U. S. Standards, *F. R.*, Oct. 2, p. 7782.

Strawberries, frozen, AMS notice of proposed amended U. S. Standards, *F. R.*, Oct. 8, p. 8005.

Lettuce, AMS notice of amended U. S. Standards, *F. R.*, Oct. 9, p. 8011.

On apples, tolerances of mercaptobenzothiazole, *F. R.*, Sept. 17, p. 7407.

On apples, certain citrus fruits, pears, and pineapple, tolerances of sodium o-phenylphenate, *F. R.*, Sept. 19, p. 7463.

On apples, crabappies, pears, and quinces, tolerances of s-(p-chlorophenylthio)-methyl o, o-diethyl phosphorodithioate, *F. R.*, Sept. 20, p. 7503.

Tolerances for residue of Monuron, correction, *F. R.*, Sept. 28, p. 7747.

On cantaloupes, tolerances of tetraiodoethylene, *F. R.*, Sept. 28, p. 7747.

On broccoli, brussels sprouts, cabbage, cauliflower, clover, collards, kale, mustard greens, peaches, plums, spinach, strawberries, turnip tops, apples, lettuce, pears, cucumbers, onions, beans, corn grain, peas, potatoes, tomatoes, turnips, tolerances of 1-methoxycarbonyl-1-propoen-2-yl-dimethylphosphate, *F. R.*, Oct. 11, p. 8082.

Lemonade, certain types of frozen concentrates, FDA Standard of Identity, notice of further extension of time for filing comments, *F. R.*, Sept. 26, p. 7660.

Prune juice, canned, FDA standard of identity, notice of further extension of time for filing briefs, *F. R.* Sept. 26, p. 7660.

Cheeses, processed cheeses, cheese foods, cheese spreads & related foods, order staying FDA standard of identity for grated American cheese food, *F. R.*, Oct. 2, p. 7785.

Cleanliness, corrosion-resistance and long service life make this Wissco Stainless Steel Belt a natural choice for Kraft's cheese cooling operations.

FAMOUS NAMES
ride on WISSCO BELTS
Kraft Foods Ltd. • Montreal

The story of Wissco Belts is best told by their users. For instance, Mr. Paul Katien, Vice President in Charge of Production, Kraft Foods Ltd., Montreal, says:

"In the three years that we have been using our stainless steel Wissco Belt, we have realized a production increase of about 300,000 jars of cheese per year and attendant savings of about $14,800 in belt costs."

The belt is used to transport jars of hot cheese through a cold water cooling tunnel, a 20-minute trip. It runs continuously eight hours a day, five days a week, and is under a constant stream of cold water.

"We have been able to maintain our cooling production quota of 125 jars a minute since the Wissco Stainless Steel Belt was installed," Mr. Katien continues. "Formerly, we used galvanized belts, but they rusted away under the steady water treatment, making it necessary for us to install two new belts per year. The Wissco Belt has given us three consecutive years of completely trouble-free service to date . . . at a savings of $14,800 so far.

"Downtime on galvanized belt replacement and repairs was costing us an estimated annual production loss of 330,000 jars plus about $1,000 in wages paid for periods during which no work was being done. Our Wissco Belt eliminated all of this and still shows not even the slightest trace of rust, corrosion or dirt which developed in galvanized belts. We can't even specualte as to when we will be replacing this belt . . . but when we do, it will certainly be with another Wissco."

Increased production . . . uninterrupted service over long periods under adverse conditions . . . economy in wages saved and in replacement costs. Strong arguments in favor of using Wissco Belts in any processing or conveying operation. Let us prove what they'll do for you.

5430

WISSCO BELTS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

THE COLORADO FUEL AND IRON CORPORATION • Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo • Chicago • Detroit
New Orleans • New York • Philadelphia • CF&I OFFICES IN CANADA: Montreal • Toronto

You Can't Find the Cost of a Valve on a Price List

With today's high maintenance expense, the cost of keeping a troublesome valve in repair can dwarf its original price in a few months' time. The minute a maintenance man touches a wrench to a valve, its cost is often doubled. That's why the purchasing trend is to *top quality* —the longest-lasting, most dependable industrial equipment on the market. And in the valve field, that means Lunkenheimer . . . famous for quality and maintenance-free service since 1862. The Lunkenheimer Company, Box 360 Annex Station, Cincinnati 14, Ohio.

The cost of a Lunkenheimer Valve gets smaller...and smaller...and smaller... with each passing year of dependable service

LQ600-150
150 lb. S. P.
300 lb. W. O. G.

LQ600-200
200 lb. S. P.
400 lb. W. O. G. 550°F.

¼ to 2 inches

WRITE FOR NEW FOLDER
"The Evidence in the Case"
Review Actual Case Histories from the Files of Industry on
HOW TO CUT MAINTENANCE

BRONZE • IRON • STEEL • PVC

E-467-17

LUNKENHEIMER QUALITY

LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

Salt Dissolvers, Brine Storage Units Now Available in Corrosion-Proof Plastic

Here's important news for every user of salt brine. In response to a growing demand for equipment that will not rust or corrode in use, International is now offering fully automatic plastic dissolvers for both rock and evaporated salt—as well as plastic storage tanks for brine. Already in use in many plants, these plastic units give the same fine performance as International's metal equipment, with this important added feature: they are 100% corrosion-proof.

To select the correct plastic for these new units, International's researchers conducted an exhaustive series of tests. These tests showed that a fiber-glass-reinforced polyester is most suitable for the job. Made of this material, the new plastic units will stand up, with strength to spare, when loaded to full capacity.

The reinforced plastic used in this new equipment is completely unaffected by any chemical action of salt or brine. Because of this feature, there can never be any rust specks in the brine, and there is no danger of contaminating the brine's flavor or color.

Durable, long-wearing . . . In addition to being corrosion-proof, the plastic in International's new equipment has another important advantage. It is

LOOKING DOWN into the new plastic dissolver. Shows simple, rugged construction . . . float for liquid level control . . . circular pipe for admitting water into dissolving chamber.

unusually strong and durable—has one of the highest weight-strength ratios known today. In fact, during one testing procedure, a plastic brine storage unit was loaded with over 3,500 lbs. of coarse rock salt—and showed no deformation anywhere. Furthermore, this plastic will not dent or chip even under the severest conditions. As a result, years of trouble-free service are expected from these new units.

Sturdy construction is used throughout the dissolvers and storage tanks. For example, the points at which pipes or couplings enter the units are even stronger than the units themselves. Here, a new resin cement has been used to provide a tough, lasting bond between connections and tank walls.

Other features . . . The dissolvers and storage tanks—being made of plastic—need no painting or other maintenance. The units are especially light in weight, making installation or moving a simple job. And because they are translucent, the true brine or salt level is always visible.

Two types of salt dissolver available . . . For making high-quality brine from rock salt, the Sterling Model Lixator is available in plastic. This unit is a duplicate of International Salt Company's famous metal Lixator—and operates on exactly the same principle. Crystal-clear, fully saturated brine for all plant uses is made automatically by the Lixator—and can be delivered automatically to all points of use from the Lixator.

Also available in plastic is the Sterling Evaporated Salt Dissolver for making brine from different types of evaporated salt. Both these plastic dissolvers offer the same savings in labor, space, and salt as the same models made of metal.

STERLING MODEL LIXATOR IN PLASTIC. Widely used today for making Lixate Brine for water softening, canning, meat packing, chemical manufacture, etc.

The new plastic dissolvers are available in the same standard sizes as International's metal units. And the brine storage tanks in plastic can be made in sizes to meet a plant's specific requirements.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on the new plastic equipment—just contact your nearest International Salt Company sales office.

International Salt Co., Scranton, Pa.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

FOR INDUSTRY, FARM, AND THE HOME—

STERLING SALT

PRODUCT OF INTERNATIONAL SALT CO., INC.

Here's
BIG-VOLUME SIFTING
with BIG SAVINGS!

RICHMOND/SPROUT-WALDRON
Gyro-Whip Sifters

Amazingly compact, yet big in output, Gyro-Whip Sifters save floor space. Simplified design reduces maintenance and cleaning time and makes possible the most rigid standards of sanitation.

The average Gyro-Whip is only 48" high, requires only 3½' x 3½' floor space, and operates on only ¾ h.p. Bolting areas range from 47.5 up to 95 sq. ft.

These Gyro-Whip Sifters are available in sizes from 3-sieve to 20-sieve mounted models. Also available are free-swinging supersifters with as many as 180 sieves. Can sift from 2 mesh up to 325 mesh. Stainless steel and wood construction. Aspirator tips to air wash graded products can be provided. Installation can be on the stream. It is a self-contained unit, ready to be bolted down and connected to existing spouting.

Write for Bulletin 135-A.

FB/608-P

SPROUT-WALDRON
Manufacturing Engineers Since 1866
25 LOGAN STREET • MUNCY, PA.
EQUIPMENT FOR SIZE REDUCTION, MIXING & BLENDING, PELLETING & CUBING, BULK MATERIALS HANDLING, PRODUCT CLASSIFICATION.

MEN & COMPANIES

Personnel

John M. Ashcroft takes on new-made job of managing sales promotion for hotel and restaurant products in H. J. Heinz Co. marketing division.

Robert A. Davis has been appointed general advertising manager of Kraft Foods.

Samuel H. Desch has been elected executive v.-p. of Pepsi-Cola International.

Howard G. Dick will fill Minute Maid Corp.'s newly-created post of advertising and marketing director.

Dr. William B. Esselen is now head of food technology at M.I.T. After his appointment to the staff in 1941, he served the War Food Administration and U. S. Army Quartermaster Corps on leave of absence.

Charles J. Forst has been named president and treasurer of Forst Packing Co. Grandson of the founder, he recently acquired controlling interest in firm. Further, **Leon Forst** has been appointed chairman and executive v.-p.

Clifford E. Gibson is new v.-p. of Weibel, Inc., Calif. champagne producer.

Dr. D. M. Irvine, whose specific interest is cheese production, becomes head of dairy department at Ontario Agricultural College. Earlier, he was at U. of Wisconsin, where he worked on the development of new cheeses.

Wesley W. Jennings is now marketing v.-p., and **Dale A. Kilpatrick** provisions v.-p. for Rath Packing Co., Waterloo, Ia.

Norman F. Johnston has been appointed research and development director of Hunt Foods, Hayward, Calif. He will apply engineering and economics to production, proc-

Homer R. Davison—*Accents Modern Approach by Packers*

"No business can succeed by pursuing the status quo." So says Homer R. Davison, first new president of the American Meat Institute in 18 years, succeeding Wesley Hardenbergh.

As he sees it, the answer to current packing problems is to accent modernization—from growing animals with more lean to automating plants.

Stepping up from v.-p., he brings a lot of know-how. After receiving his B.S. in agriculture from the U. of Illinois, he became commissioner on the Chicago Live Stock Exchange. Then four years later he joined AMI—where he has won special recognition for his promotion of better understanding between producers and processors of meat.

As for changes, however, there's one of a legislative nature that he *doesn't* want—that is, a switch of meat-processing regulation over to the Federal Trade Commission, as is now being pushed in Congress. He emphasizes his belief that packers should keep the same referee they've had for the past 36 years—USDA.

Mr. Davison has also served as v.-p. and director of the AMI Foundation and of the Manufacturers Cooperative Assn. Further, he's been a member of the President's National Agricultural Advisory Commission, and a director of the Chemurgic Agricultural Research Association. Also, he has engaged in committee work with Purdue's Institute for Animal Agriculture and the U. S. Chamber of Commerce.

← For more data, circle this page number on card at back

JUST OUT!

All-new '58 DODGE *PowerGiants*

4-WAY LEADERS OF THE LOW-PRICED 3

Now—for the first time in truck history—one make leads the low-priced three *all four ways!* And that make is DODGE—all new for 1958!

From the future comes Dodge styling — handsome, sweeping, prestige-winning lines, richly trimmed in sparkling chrome.

From 40 years of truck experience comes remarkable engineering advances . . . outstanding performance, load capacities and economy.

See these great new trucks soon. And be *sure* to get your Dodge dealer's special 40th-anniversary deal before you buy any other make!

1 **FIRST IN PAYLOAD!** Advanced construction gives extra strength *without* extra weight, lets you haul up to ⅓ more, cut down on trips.

2 **FIRST IN POWER!** New 204- to 234-hp. *Power Giant* V-8's! Extra power cuts trip time, lets you pass more safely, reduces engine strain.

3 **FIRST IN ECONOMY!** Most advanced of all V-8 truck engines. Exclusive Power-Dome combustion increases gas mileage, cuts upkeep costs.

4 **FIRST IN STYLING!** All-new design! Deluxe chrome grille and trim . . . modern dual headlights . . . future-inspired lines . . . smart new colors.

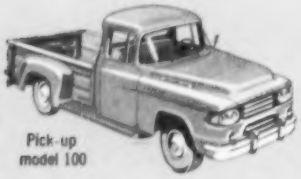
TURN PAGE FOR FULL-LINE STORY

There's a

'58 DODGE *PowerGiant*

for every job . . . for every business . . . for every pocketbook

Low-tonnage models



Pick-up
model 100

Town Panel
model 100

Town Wagon
model 100

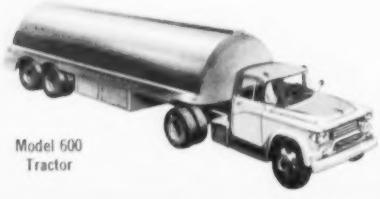
Forward-Control
model P300

Medium-tonnage models

Model 400
Van Body

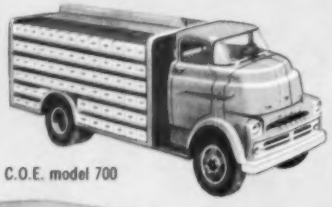
Model 500—Stake

Four-Wheel-Drive
W500
Chassis

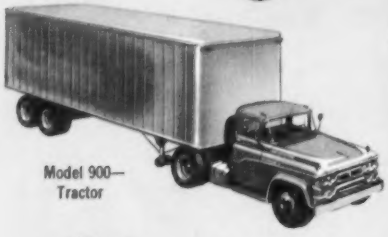


Model 600
Tractor

Heavy-duty models



C.O.E. model 700



Model 900—
Tractor

Model T800—
Mixer Body

Model T900—
Dump Body

CONDENSED SPECIFICATIONS

CONVENTIONAL MODELS

G.V.W. Range
4,250 lbs. to 9,000 lbs.
Engines
120-hp. 6-cylinder
204-hp. V-8

4-WHEEL-DRIVE MODELS

G.V.W. Range
5,100 lbs. to 10,000 lbs.
Engines
113- 120- 125-hp. 6-cyl.
204-hp. V-8
204-hp. V-8 (Heavy-Duty)

FORWARD-CONTROL MODELS

G.V.W. Range
6,000 lbs. to 9,000 lbs.
Engines
120-hp. 6-cylinder
204-hp. V-8

CONVENTIONAL MODELS

G.V.W. Range—11,000 lbs. to 22,000 lbs.
Engines—125- 130- 141-hp. 6-cyl.
204- (H.D.) 207-hp. V-8's

C.O.E. MODELS

G.V.W. Range—15,000 lbs. to 22,000 lbs.
Engines—204- (H.D.) 207- 218-hp. V-8's

4-WHEEL-DRIVE MODELS

G.V.W. Range—15,000 lbs. to 20,000 lbs.
Engines—130-hp. 6-cylinder
204- (H.D.) 207-hp. V-8's

SCHOOL BUS MODELS

G.V.W. Range—10,500 lbs. to 22,000 lbs.
Engines—125- 130- 141-hp. 6-cyls.
204- (H.D.) 207-hp. V-8's

FORWARD-CONTROL MODELS

G.V.W. Range—7,500 lbs. to 15,000 lbs.
Engines—120-hp. 6-cylinder
204-hp. V-8

CONVENTIONAL MODELS

G.V.W. Range
18,500 lbs. to 30,000 lbs.
Engines
218- 224- 234-hp. V-8's

C.O.E. MODELS

G.V.W. Range
18,500 lbs. to 25,000 lbs.
Engines
218-hp. V-8

TANDEM MODELS

G.V.W. Range
26,000 lbs. to 46,000 lbs.
Engines
218- 224- 234-hp. V-8's

SCHOOL BUS MODELS

G.V.W. Range
17,500 to 23,000 lbs.
Engines
218-hp. V-8

Laurence W. Murphy of Geo. A. Hormel & Co., and **Leonard T. Force** of Canada Packers, Toronto, go fifty-fifty on Dodge & Olcott's third annual award in meat industry. Former's entry was method of sticking non-shackled hogs, previously put to sleep with CO_2 (a development of the "painless kill" for which Hormel received 1953 FE award). Force's entry was development of "Can Pak" process of hide removal, with carcass remaining attached to overhead monorail.

essing, packaging, distribution, and utilization of food and other products.

L. M. McAlvany is now assistant to president for sales, merchandising, and advertising of the American Bakeries Co.

Spencer S. Meilstrup, V.-P. and sales manager, Diamond Crystal Salt Co., becomes a director.

Harry E. Meyn has been elected v.-p. of Interstate Bakeries Corp., Kansas City, Mo.

W. G. Mueller, Jr. moves up to chairman of American Packing Co., and **W. G. Mueller, III,** to president. **Edward W. Olszewski** is named v.-p.

Arni Olafsson is new v.-p. and sales manager at Coldwater Seafood Corp., New York City.

John Shafer has been promoted to general sales manager of Dole Hawaiian Pineapple Co.

Simpson E. Spencer, Jr., has been named assistant to purchasing v.-p. at General Foods.

George Stark, president of Stark, Wetzel & Co., Inc., is new board chairman of American Meat Institute.

Dr. Harry L. Wildasin has been named Q.C. director for H. P. Hood & Sons, Boston.

Industry

Anheuser-Busch has named contractors for new $20 million Budweiser plant in Tampa, Fla.

Blitz Weinhard Co., Portland, Ore., announces $1 million expansion program.

Dr. William H. Stahl has been selected for McCormick & Co.'s recently created post of research manager. His special interest is micro- and macro-analysis of odors and flavors, which have tended to elude exact instrumental measurement. He is chairman of northeastern analytical group of the American Chemical Society.

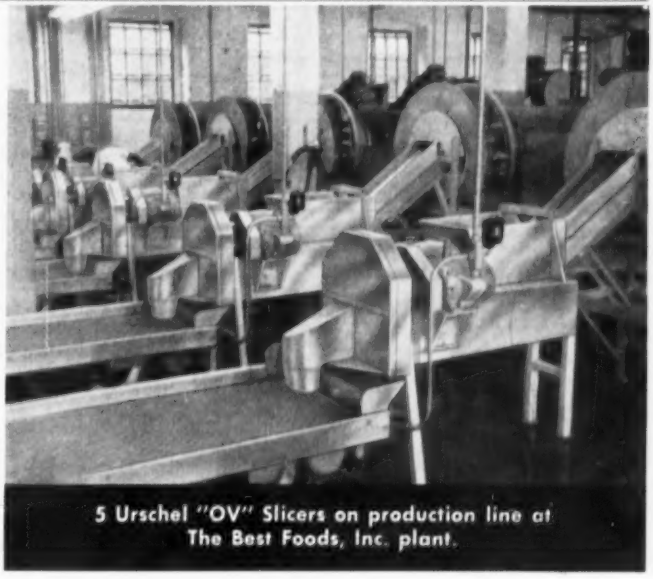
The Best Foods, Inc. Production Record:

fresh CUCUMBERS

Sliced on Urschel high speed model

"OV" TRANSVERSE SLICERS

The Best Foods, Inc., Norfolk, Virginia, packers of the old, famous "Fannings Bread and Butter Pickles" brand, report that during a 3 month period their Urschel "OV's", with positive feed action, sliced enough fresh cucumbers to supply their entire yearly requirements. The units were operated a minimum of 10 hours a day, with only incidental maintenance.



5 Urschel "OV" Slicers on production line at The Best Foods, Inc. plant.

Model "OV" Slicers also cut Carrots, Celery, Rhubarb, Broccoli, Okra, Squash, Bamboo Shoots and Water Chestnuts • uniform, clean cross-cuts with no product crushing • practically eliminate "thin" or "bias" cuts • slice thicknesses of 1/16" to 1-1/3" • rugged, dependable

Write for full details now

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

THEY'RE *BETTER* MADE WITH *Clinton*® PRODUCTS FROM CORN

All these food items are enhanced with Clinton products from corn, which include Corn Starch, Corn Syrup and Dextrose, Refined Corn Oil and Lactic Acid. With over 50 years in the corn processing industry, Clinton has both the products and the technical know-how to add more sales appeal to your food items, put more profits in your sales. Call in a Clinton man today!

50th ANNIVERSARY 1907-1957

Quality products

FROM THE WORLD'S CORN CENTER

CLINTON

CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA

George A. Hapke has been promoted by Norda, Inc., to general manager. He literally learned business from ground up—starting as elevator operator in a building Norda occupied. When New York facilities recently were enlarged and streamlined, the changeover lost less than an hour of company time—credit to Hapke.

Falstaff Brewing Corp. and **Griesedieck Bros. Brewing Co.** jointly announce their merger is planned by Jan. 1.

General Foods Funds' 1957-58 $4,000 awards for graduate study in food technology go to: John V. Spencer, who will research at Purdue U. on factors affecting flavor of poultry meat; Harry E. Snyder, U. of Calif., enzymatic breakdown of insulin; and Edmund Lusas, U. of Wisconsin, fruit and vegetable problems. Winners were selected by IFT.

Gerber Baby Foods signalizes increasing importance of packaging operations by creating new job of packaging coordinator. Ralph K. Merrill has been chosen for post.

Glidden Co. is starting construction of $4 million plant at Indianapolis to produce soybean-derived additive (trade-named "Promine") used for stepping up protein levels of staples.

Libby, McNeill & Libby is second-time winner of bronze "Oscar of Industry" for best annual report in packaged food industry, in "Financial World's" annual competition.

Paul Masson Vineyards is starting construction of a multi-million-dollar addition to its winery at Saratoga, Calif.

Milk Industry Foundation has named Hubert Garrecht, co-owner and general manager of Klinke-Reed Dairy, as president.

My Bread Baking Co., New Bedford, Mass., member of Quality Bakers of America, has received award in "Fleet Owner's" annual maintenance efficiency competition.

National Prepared Frozen Food Processors Assn. has elected Hy Epstein president.

Minute Maid Corp. and **Seabrook Farms** jointly announce latter will process and sell Snow Crop products in most of U. S., except for frozen citrus juices, which Minute Maid will continue to handle.

Stella D'Oro, New York cookie-maker, will build $500,000 plant in San Leandro, Calif.

Associated Industries

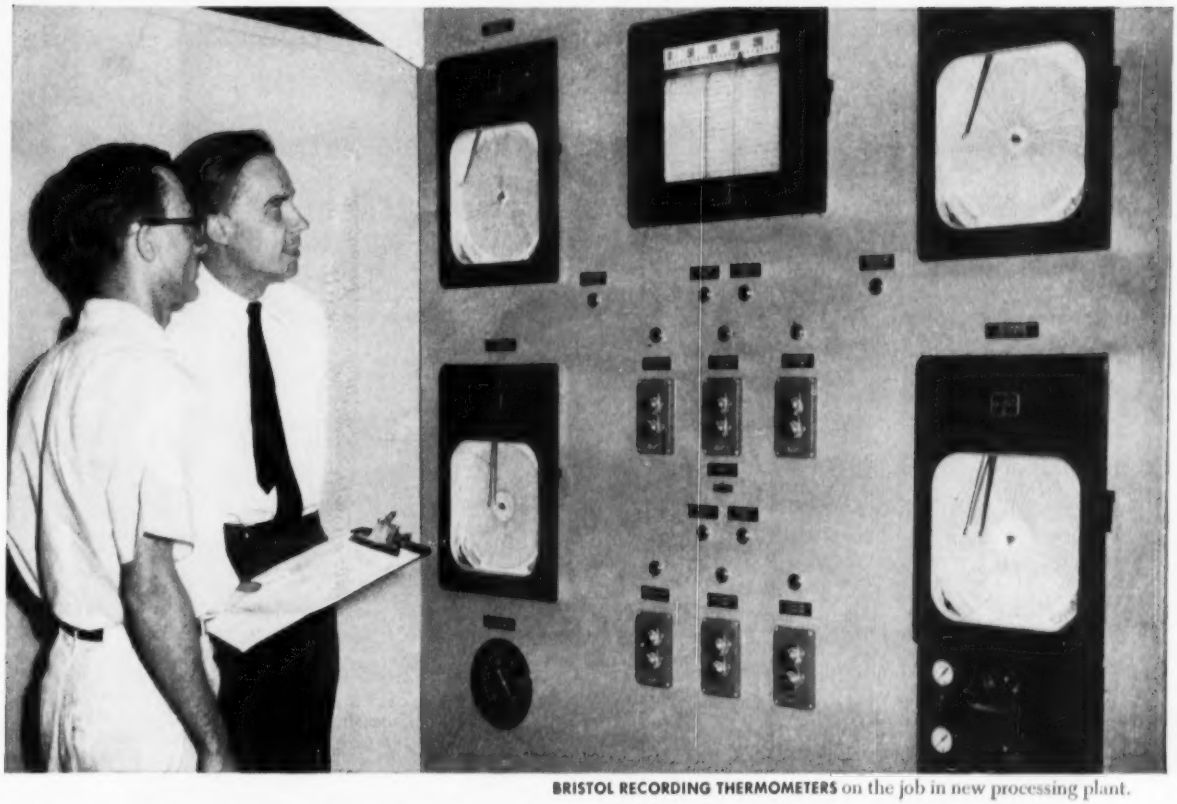
American Can Co. has appointed Daniel T. Hayes, a specialist in plastic container development, to its new products department, with headquarters in New York City.

Blaw-Knox has promoted James A. Kelly to advertising

(*Cont'd on p.* 145)

Charles W. Kaufman has been named research director for National Dairy Products Corp. Formerly v.-p., research, for Kraft div., he will now coordinate organization's overall research. Company goal has been better integration of units without losing benefits of decentralized management.

WHAT'S NEWS AT BRISTOL...



BRISTOL RECORDING THERMOMETERS on the job in new processing plant.

Can you pass this recording thermometer quiz?

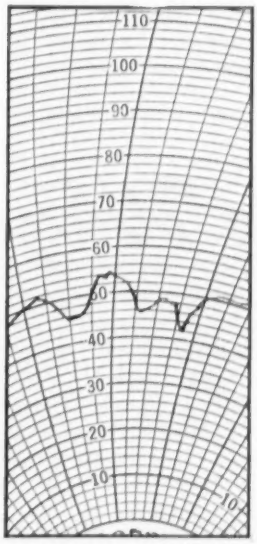
Question: ***Why do Bristol Recording Thermometers continue to lead the field?***

Answer: ***Because of Bristol's continuous research and development program. Two outstanding results of this program are:***

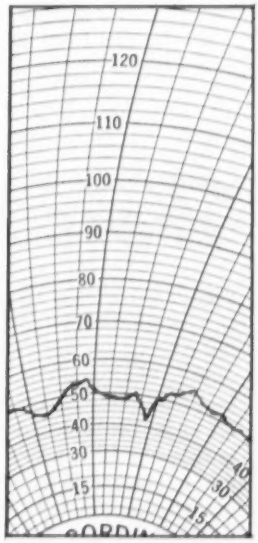
1. The 2L Uniform-Scale Vapor Pressure Thermometer which gives you all the advantages of vapor pressure thermometer actuation without the problems of the conventional non-linear increasing scale—*greatest advance in recording thermometers in 25 years.*

2. A basic improvement that eliminates ambient temperature effects. Whether you are measuring *above, below* or *at* ambient temperature, you get the same unvarying accuracy with the new Bristol Vapor-Pressure Recording Thermometers.

Want to know more? Write today for free 48-page bulletin T840 on the complete line of Bristol Recording Thermometers, liquid, vapor-pressure, and gas filled for every application. It tells all about typical installations, ranges, charts, bulbs, tubing. The Bristol Company, 115 Bristol Road, Waterbury 20, Conn.



NEW LINEAR CHART for 2L. Note easy readability due to equal chart increments.



OLD NON-LINEAR CHART. Note how scale values crowd together at bottom.

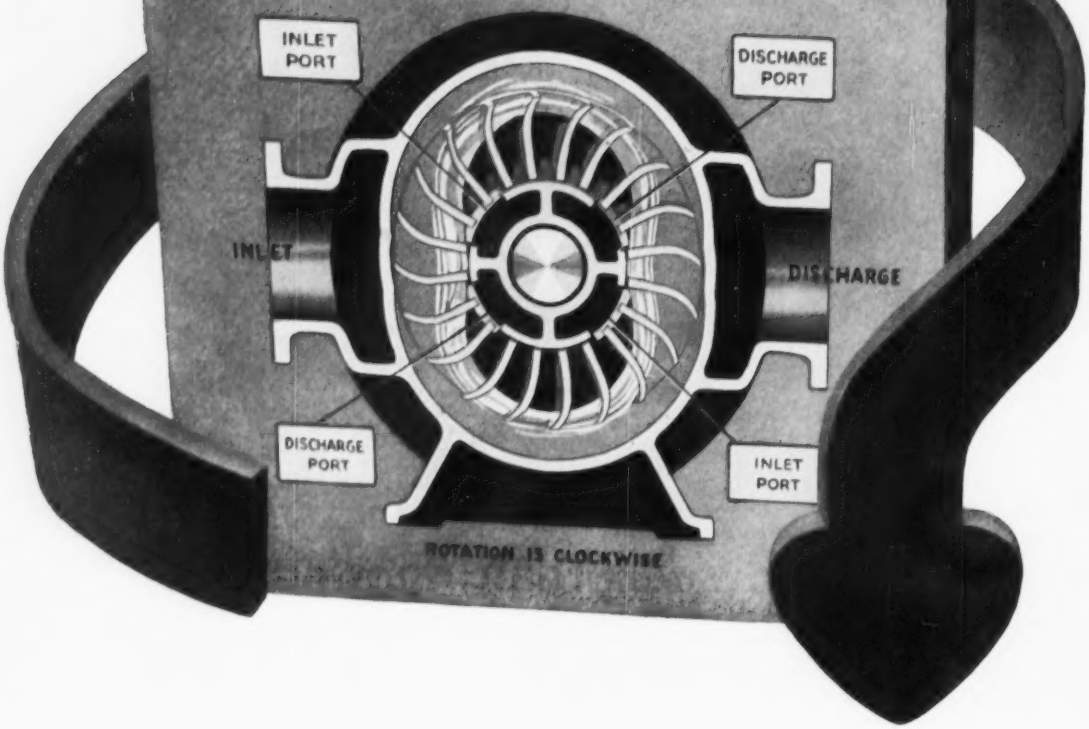
6.82

BRISTOL *TRAIL-BLAZERS IN PROCESS AUTOMATION*

BRISTOL'S

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters



Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

No oil filters.
No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

NASH ENGINEERING COMPANY
395 WILSON, SO. NORWALK, CONN.

manager for both dairy equipment and Buflovak Equipment divisions.

Container Corp. of America has opened its new folding carton plant in Renton, Wash.

Continental Can Co. has named v.-p. John Murray as director of technical development. He will boss company's studies of gamma ray effects on packaging materials at the nuclear reactor being built in Plainsboro, N. J. Also, he will head the new $7½ million metal development headquarters in Chicago.

International Nickel Co. has established a chair in chemical metallurgy at Columbia U. Grant is $350,000.

Crown Cork & Seal Co. has elected Karl W. Mueller as executive v.-p. Company says its Philadelphia can division's 6-figure expansion is now in the final stages.

Chas. Pfizer & Co., Inc., has elected Conrad G. Hurlimann director and v.-p. of Pfizer International Subsidiaries.

Deaths

Louis F. Barth, 52, general manufacturing manager, Colonial Stores, Inc.

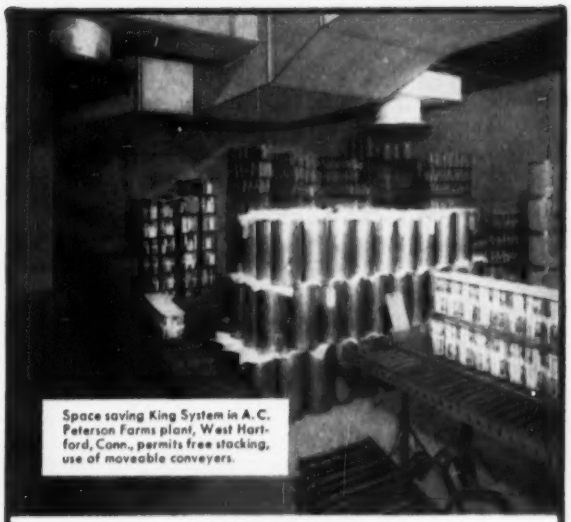
Joseph M. Collins, 50, Cola-Cola v.-p., Atlanta.

Robert Dillman, recently retired executive, Libby, McNeill & Libby.

George L. Hartford, 92, of A&P, son of founder, and chairman since 1925.

Julius Liebmann, 89, grandson of founder of Liebmann Breweries, producer of Rheingold beer. Retired since 1950, he was one of veteran brewers who captained their firms through tough Prohibition times.

John M. Sarther, 68, v.-p. and board member of Consolidated Foods Corp. He joined firm in 1950. His career, which included executive posts with National Tea Co. and Jewel Food Stores, began with a single retail store in Chicago that he built into Great American Stores Co.


Space saving King System in A. C. Peterson Farms plant, West Hartford, Conn., permits free stacking, use of moveable conveyers.

KING
SHARP FREEZE
SYSTEMS
are
ENGINEERED
FOR YOU

A complete sharp freeze or cold storage system individually designed to meet your requirements

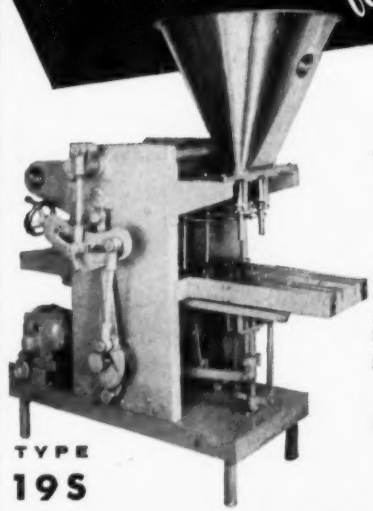
Whether your plant is large or small, a King Sharp Freeze System, individually designed for your specific needs, will give you better performance with lower operation and maintenance costs. Complete low-side equipment can be installed out of the production area, in basement, attic or on roof. King Sharp Freeze Systems are adaptable for ammonia, freon or brine refrigerants. Our engineering staff, with more than 50 years leadership in air movement design and manufacture, is at your service.

- Fast hardening
- No defrosting shutdowns
- Clean frost-free rooms
- Uniform temperature
- Increased product space
- Minimum service needs

See your nearest King distributor or write for technical bulletins

THE King COMPANY OF OWATONNA
905 N. CEDAR ST. OWATONNA, MINNESOTA

TAILOR-MADE for filling



LIQUID VISCOUS and SEMI-SOLID FOOD PRODUCTS

including: Mayonnaise • Salad Dressing • Jellies, Jams and Preserves • Soups • Horse Radish • Potato Salad • Cake Batters and others

by Hope — ESTABLISHED SINCE 1908

TYPE 195

Builders & Designers Specializing in Filling Machines for Over a Quarter of a Century.
Write for Literature

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NEW

FAIRBANKS-MORSE

INTEGRAL HP

SINGLE PHASE

CAPACITOR

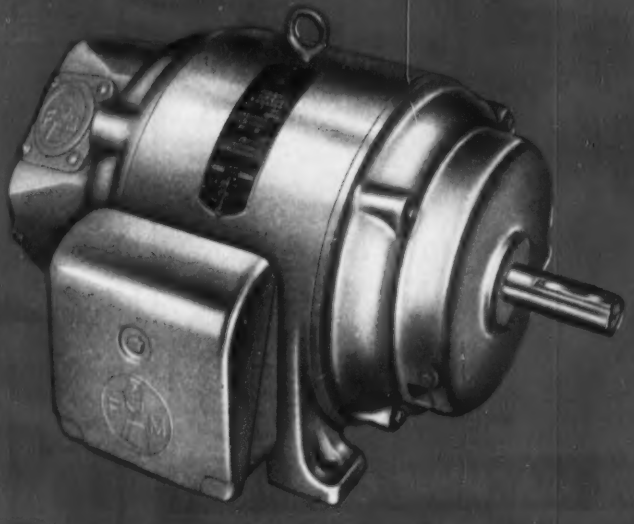
MOTORS

Newest addition to the F-M line of improved electrical equipment, single-phase capacitor-start motors are designed for severe applications.

New drip-proof frame and bearing arms are rigid, durable, corrosion-resistant. No pressed steel or sheet aluminum in any structural part. Famous F-M Copperspun rotor with shaft, fans and centrifugal switching mechanism dynamically balanced as a unit for smooth, vibrationless operation.

Starting capacitors are designed for maximum starting torque . . . minimum starting current. Rugged, trouble-free centrifugal switch features oversized snap-action contacts.

New Bulletin 2401 giving complete details will bring you up to date on the newest in capacitor-start, induction-run motors. Write: Fairbanks, Morse & Co., Dept. FE-11, Chicago 5, Illinois.



FAIRBANKS-MORSE

a name worth remembering when you want the BEST

ELECTRIC MOTORS AND GENERATORS • DIESEL LOCOMOTIVES AND ENGINES • PUMPS • SCALES • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

*Research report from Continental**

RESEARCH AT CONTINENTAL BREAKS THE "PRESSURIZED FOOD" BARRIER

Look for a new era in pressurized packaging, thanks to Continental research. Previously, the only marketable pressurized foodstuffs were foam products like whipped cream. Now Continental engineers have pressure packaged such foodstuffs as salad dressings, catsup, mustard, meat tenderizers and sauces, table syrups, cake toppings, and chocolate syrup.

Designing pressurized containers for these foodstuffs seemed a formidable task. Non-toxic compressed gases did not give a spray or stream pattern with known types of dispensing and left as much as 20% product residue in the container.

To overcome these obstacles, Continental engineers began sustained experimentation with numerous gas mixtures, with specially designed valve openings and actuators, and with many different food products. Pressurized food containers developed by this research dispense water-base or oil-base food products by means of non-toxic propellants in a spray or stream pattern with a minimum of aeration and product residue.

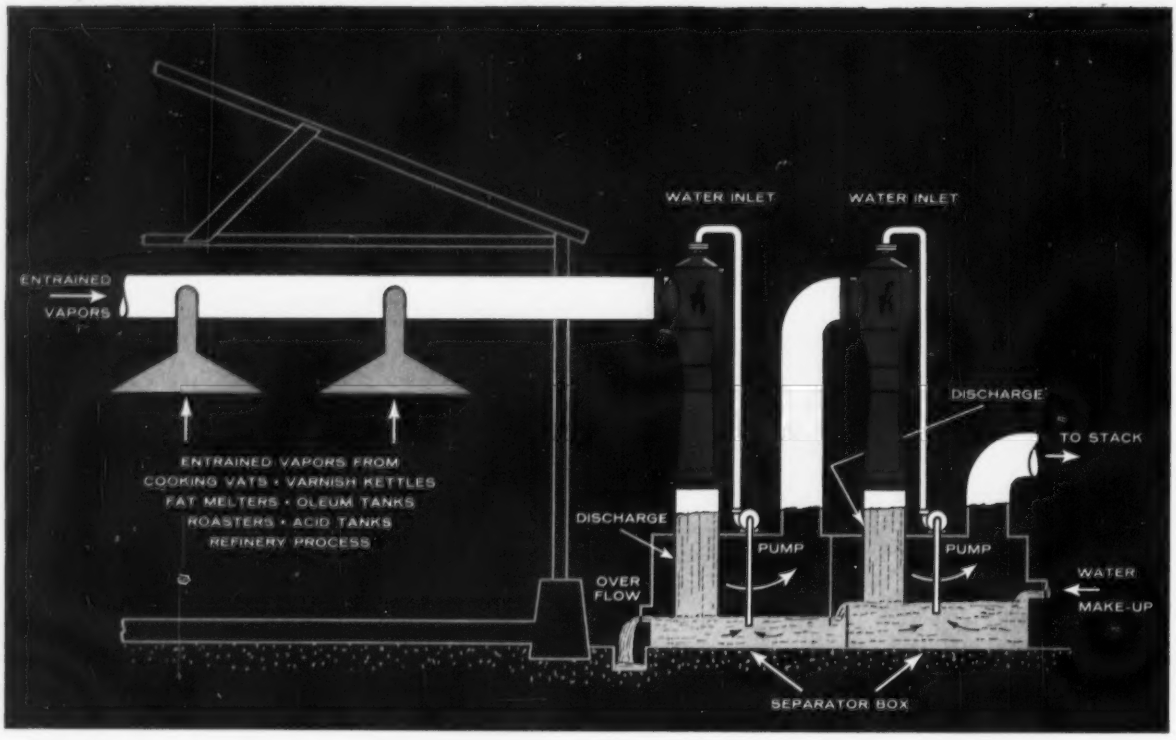
This is one more example of successful Continental research on a basic container problem. If you have a packaging or processing problem, Continental experts can help you solve it. Why not call your nearest Continental representative.

TOP AWARD WINNER. For the excellence of its modern, scientific design, Continental's new 7.5 million dollar Chicago research center has won the honor award of the Chicago chapter of the American Institute of Architects and the Chicago Association of Commerce and Industry.

QUALITY Continental SERVICE

CONTINENTAL CAN COMPANY

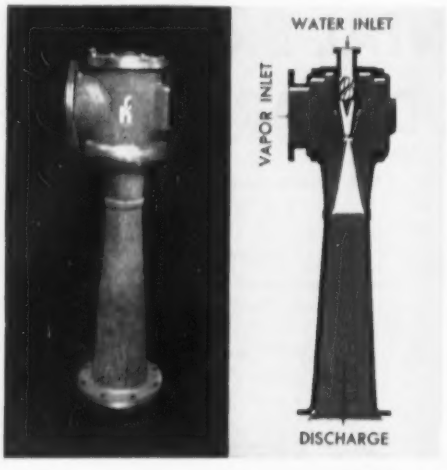
Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 5595 Pare St., Montreal, Que.



CONTROL OBJECTIONABLE FUMES, GASES, VAPORS

with an economical SK Fume Scrubber

Photo and sectional drawing of an SK Fig. 4010 Fume Scrubber



A food plant in California uses an SK Fume Scrubber to condense steam and scrub oil vapors from cooking vats. A large chemical manufacturing plant on the eastern seaboard uses a battery of SK Fume Scrubbers to condense steam and purge entrained gas containing H_2SO_4, SO_2, H_2S, TiO_2, and ore dust. A mid-western manufacturer uses SK Fume Scrubbers to vent oleum tanks. A soap maker in Pennsylvania uses a scrubber to remove ammonia fumes from a plant building and cool the building at the same time.

From coast to coast, chemical and food processing plants, refineries, paint and varnish manufacturers, fertilizer, and other manufacturing plants are using SK Fume Scrubbers to control objectionable—sometimes dangerous—fumes, gases, vapors, and dusts.

These manufacturers have found that SK Fume Scrubbers are reasonably low in initial cost, require little maintenance, and are an effective means for conforming to local ordinances which prohibit the pollution of air.

Made in a wide range of sizes from cast iron, steel plate, Haveg, stoneware, or other materials or with linings of rubber or Polyvinyl Chloride, or other synthetic materials, SK Fume Scrubbers can help you solve a fume or dust problem. Why not get the whole story. Send for Bulletin 4R which contains complete information on SK Fume Scrubbers.

JET APPARATUS: Ask for Condensed Bulletin J-1.
ROTAMETERS & FLOW INDICATORS: Ask for Condensed Bulletin 10-RA.
VALVES: Ask for Condensed Bulletin V-1.
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.

Schutte and Koerting
COMPANY
MANUFACTURING ENGINEERS SINCE 1876
2223 State Road, Cornwells Heights, Bucks County, Pa.

QUESTIONS AND ANSWERS

THIS MONTH'S PROBLEM

Non-Uniform Quality

Question—In examining our canned goods, we have observed occasional samples that are decidedly light in color compared to our regular production.

We can't trace these light-colored products to any one retort or account for them in any other way. Can you throw some light on this mystery?

SEPTEMBER PROBLEM

Erratic Cartoning

Question—Last fall we replaced a hand-cartoning operation with an automatic high-speed unit. It operated perfectly until the winter, when we started to get erratic results. Tearing and jamming of cartons caused considerable time loss, although we hadn't changed our method of operation.

After a while, the difficulty seemed to correct itself, but during the recent summer months, we again had trouble. It doesn't seem likely that the operation of such a machine would be affected by weather. Still we haven't been able to find any other variable. Do you have any idea of what might be happening?

Answer—It certainly doesn't seem likely that a machine can be affected by weather. But the cartons handled are definitely sensitive to moisture, since they are made of paper pulp. And moisture content of the atmosphere varies with weather conditions.

Apparently, you started operating in the fall, when humidity was average and cartons were neither too dry, nor too wet. Machine adjustments were set accordingly.

During the winter, however, your cartons probably lost moisture in low-humidity storage. Cracks along score lines would indicate such drying, which would give trouble in high-speed automatic cartoning. Uneven drying of cartons would also give erratic operation.

Since these difficulties recur during the summer, your cartons probably are too wet this time. We are deducing that this may have been the pattern.

But there are other factors, such as your method of storing cartons. If, to conserve space, you are stacking flat cartons higher than formerly, some of the bottom ones may suffer from "warehouse fatigue". This is another variable in behaviour of cartons in the machine.

We suggest that you discuss this matter with your carton supplier. Possibly, you will want to minimize inventory during certain seasons.

Also, you might try using a small dehumidifier in the summer, and a humidifier during the winter.

High Electric Bills

Question—We are concerned with recent increases in our electric bills. So we would like to make some sort of check on what is happening and what can be done to hold costs in line. Can you suggest steps we can take without going into a great deal of expense for instruments, etc.?

Answer—Much valuable information can be gained from a recording wattmeter and voltmeter, which can be moved around your plant and used to check first one point and then another.

The wattmeter must be chosen for your particular type of electrical system. For example, if you have three phase-three wire, a two-current element meter is sufficient. But for a three phase-four wire system, a three-current element is needed.

Begin by using the recording meters to check total plant electric load for a number of days. Chart records will show not only actual kilowatts you are drawing, but many other pertinent bits of information as well.

You can readily observe peak loads and see whether they occur at the same time of day, or on what day of the week. Night load conditions will show up, when perhaps your supervision is not at the normal day-time level. Other useful data will be readily observed on starting of plant electrical equipment in the morning, noon shutdowns, and end-of-shift shutdowns.

Through these records alone, you can begin to get some idea of wasted power from running equipment when not fully productive and from schedules permitting peak loads to build up at certain times.

The record of main bus voltage will show any significant fluctuations. It will also provide reference points for later determination of voltage drops at various locations.

Next, you can start moving your instruments to different departments or load centers. Here, you will begin to locate trouble spots where production is not starting or stopping on time (causing losses not only in electrical costs but also in labor efficiency).

You can take readings with equipment running idle, and thus determine friction losses. Then you can begin to relate department peak loads to each other and to the total plant peak load. This way, steps can be taken to prevent "pyramiding" of the peaks.

Finally, you can move instruments to individual motors or other major pieces of electrical equipment. Then, you will really be able to pinpoint spots where waste is occurring—motors running too far below rating, excessive voltage drops, friction loads so great they indicate need for mechanical overhaul, motors con-

HOW TO DO IT?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise). We pay space rates.

JUST ASK US

Subscribers also are invited to send in food engineering questions. We undertake to provide answers free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

NULOMOLINE

the pioneer standardized invert sugar

Favored by leading food processors throughout the world since 1909

Retained moisture . . . one of the most valuable ingredients in food products . . . is the symbol and substance of freshness.

NULOMOLINE	FOR
. . . attracts and retains moisture	baked products . . .
. . . controls crystallization	candies . . . beverages . . .
. . . retards fermentation and molds	icings . . . toppings . . .
. . . counteracts shrinkage	concentrated syrups . . .
. . . improves taste and flavor	processed foods . . .
. . . enhances appearance.	frozen desserts.

NULOMOLINE SERVICE, with its broad experience, can *help you improve and protect the quality of your products.*

Discuss your Problems in Confidence with NULOMOLINE SERVICE

Nulomoline is packed in large and small containers, tank wagons and tank cars. *Order direct or through your jobber.*

THE NULOMOLINE DIVISION
AMERICAN MOLASSES COMPANY

Manufacturers of NULOMOLINE *(Standardized Invert Sugar) and Syrups*

120 WALL STREET, NEW YORK 5, N. Y.

330 East N. Water St., Chicago 11, Ill. 1300 West 3rd St., Los Angeles 17, Calif.

NULOMOLINE, LTD., 1461 Parthenais St., Montreal, Canada

Aerial view of our Plant No. 1, Brooklyn, N.Y.

Questions & Answers

tributing to peak loads that might be operated at off-peak periods, and the like.

At this stage, too, a record of operation of a production unit will be of value in showing idle time on the charts. Idle time is an economic waste and can often be reduced once it is discovered and the reasons tracked down.

We feel quite sure that you will find the purchase of these two recording instruments well worth the investment in the many clues they will provide to improving plant efficiency.

Macaroni and Cheese

Question—Do you have directions for making a frozen macaroni-and-cheese casserole dish to be packaged in heat-and-serve aluminum foil trays and then sold frozen?

Answer—Here's a formula you can "fiddle" around with:

Milk	60 lb.
Cooked macaroni	55 lb.
American Cheese (grated)	15 lb.
Margarine	3¾ lb.
Pastry flour	3¾ lb.
Salt	7½ oz.
Worcestershire sauce	5 oz.
Pepper	2½ oz.
Mustard (dry)	¼ oz.
Curry (powder)	⅛ oz.

Make white sauce of margarine, flour, salt, pepper, curry powder, and milk. Then add Worcestershire sauce and most of the cheese (saving a little for sprinkling over each tray along with paprika). Whip in beater-type mixer until cheese melts, and mix sauce with macaroni.

After sprinkling tray-filled macaroni and cheese with paprika and cheese, bake ½ hr. at 350F., cool, and freeze.

Preventive Maintenance

Question—As the plant engineer of a moderate-sized food plant, I have been trying to interest management in a preventive-maintenance program. But I cannot convince them of its value, although I'm certain that it would be a big improvement.

The big stumbling block seems to be the cost of clerical help. In presenting this problem to you, I hope that you may be able to offer some suggestions for a fresh ap-

New from Standard Oil

RYKON

GREASE

Standard scores major breakthrough in grease technology to bring you better lubrication . . . help you make important savings in grease use, application and inventorying.

Scientists at Standard Oil have developed a new non-soap, organic, grease thickening agent. This, plus other improvements in grease formulation, is now available in a new line of Standard greases named RYKON.

Mechanical stability—RYKON Greases show little change in consistency even under severe working.

Oxidation stability—Exclusive thickener in RYKON Greases inhibits oxygen absorption. This prevents costly corrosive action on bearings.

Water resistance—Extremely resistant to water washout.

High temperature stability—RYKON Greases have an ASTM dropping point of 480° F. They have exceptional heat stability.

Resistance to change—RYKON Greases remain soft and grease-like at sustained high temperatures, continue to give thorough lubrication.

Low temperature stability—RYKON Greases work readily at low temperatures, lubricate from a cold start.

Oil separation—RYKON Greases exhibit strong resistance to bleeding.

Rust preventive properties—RYKON Greases demonstrate superior natural qualities in prevention of rust.

To meet specific grease lubrication problems, greases in four Regular and three Heavy Duty grades are available. With a single RYKON multi-purpose grease doing all jobs in the plant, there's no wrong grease to use. Money invested in grease inventories is cut, storage and application facilities are reduced. Maintenance training is simplified.

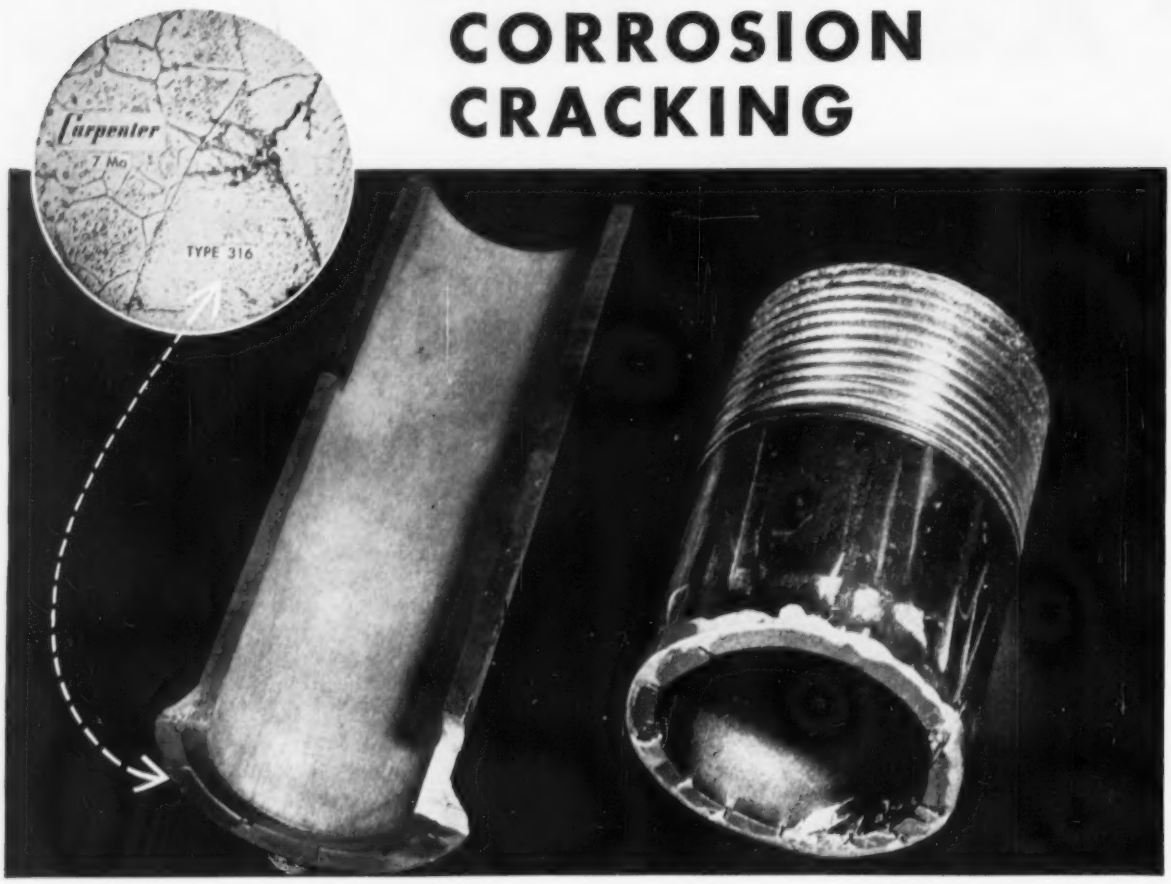
Get the facts about RYKON Greases from the industrial lubrication specialist at the Standard Oil office nearest you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)

For cost-saving control of...

STRESS CORROSION CRACKING



Carpenter 7 Mo Stainless Tubing & Pipe

Take a closer look at the above section of Carpenter 7Mo Stainless Pipe welded to a Type 316 fitting. See how stress corrosion cracking has ruined the fitting, just as it has destroyed the piece of stainless pipe at right.

Note how the cracks in the fitting stop abruptly when they reach the 7Mo pipe. And this pipe has already outlasted three such fittings. The photomicrograph shows the unmistakable proof.

If you have conditions where chlorides, caustic or sulphite solutions are present, Carpenter 7Mo's excellent resistance to general corrosion, pitting and stress corrosion cracking may prove to be a real cost-saver. Let's discuss your particular application now.

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Write for this Carpenter 7Mo Technical Bulletin.

Carpenter
more than corrosion resistance
Stainless Tubing & Pipe

← For more data, circle this page number on card at back

proach to selling the principle of preventive maintenance.

Answer—Two concepts might be of help to you. First, try to put PM into effect on a limited scale *without* the full paraphernalia of complete record cards, etc. The idea would be to gain a little first-hand experience for yourself to use as ammunition in selling the full program later.

One possible approach would be through building-maintenance, because chances are you already operate at least partially on this basis. Thus, with a minimum of time and effort, check-lists could be developed for essential building-maintenance operations on a preventive basis.

You could inspect and repair roofs, gutters, and leaders during the dry summer months, for example. Scraping and painting might be done when exterior wood is at its driest in the fall. Refrigeration and air conditioning could be made ready during late winter or early spring. And so on.

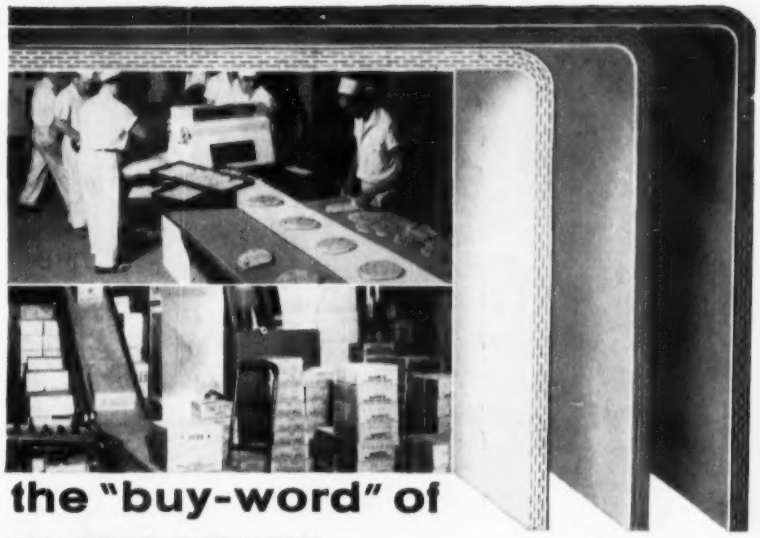
This is pretty much what is expected of you, or any other plant engineer. But the point is that, after preparing check-lists and making use of them for a while, you would be in a position to go to management and point out that the principle of PM was already accepted and had proved workable. You would then be asking merely to extend and expand an already-proved system.

Second concept—extending PM to process and packaging equipment—might well dovetail into the first. This is aimed at cutting downtime that interrupts production. One approach would be to have responsible crew chiefs or foremen keep notebook records of actual time lost for mechanical reasons each day. Do it for several weeks, then take these

---

Q.—What acidity would you recommend for best control of flavor and viscosity of vanilla ice cream mixes?

A.—Acidity should be equivalent to serum-solid content of normal milk serum employed in preparing the mixes. Since acidity and serum-solid content of milk from which mix ingredients are made is usually unknown, calculate expected acidity of normal mix by multiplying serum solids of mix by 0.02. Thus, a 10%-serum-solids mix should have a 0.2% acidity.



the "buy-word" of
THE FOOD INDUSTRY

GLOBE *Neoprene* BELTING

No wonder Globe Neoprene Belting is on the lips of every outstanding food processor. It insures protection of foods and your firm's good name whenever you have a problem of conveying, elevating or transmission.

GLOBE WHITE NEOPRENE withstands food oils, cooking oils, fats, greases, acids, alkalis, and practically everything that harms ordinary belting. Food particles can't cling to its tough, durable, but satin-smooth cover that cleans with a quick wipe of a damp cloth and STAYS clean. It absorbs no odor, flavor or taste and NEVER gets rancid. Any width up to 48-inches and in 2 to 6 ply construction.

GLOBE BLACK NEOPRENE — with the same construction features — for conveying boxes, cans, crates, canned or bottled goods.

GLOBE ROUGH SURFACE NEOPRENE — White, "Ruff Top" or brown "Kling Top" for incline or decline conveying of foods.

OTHER GLOBE PRODUCTS FOR THE FOOD INDUSTRY:

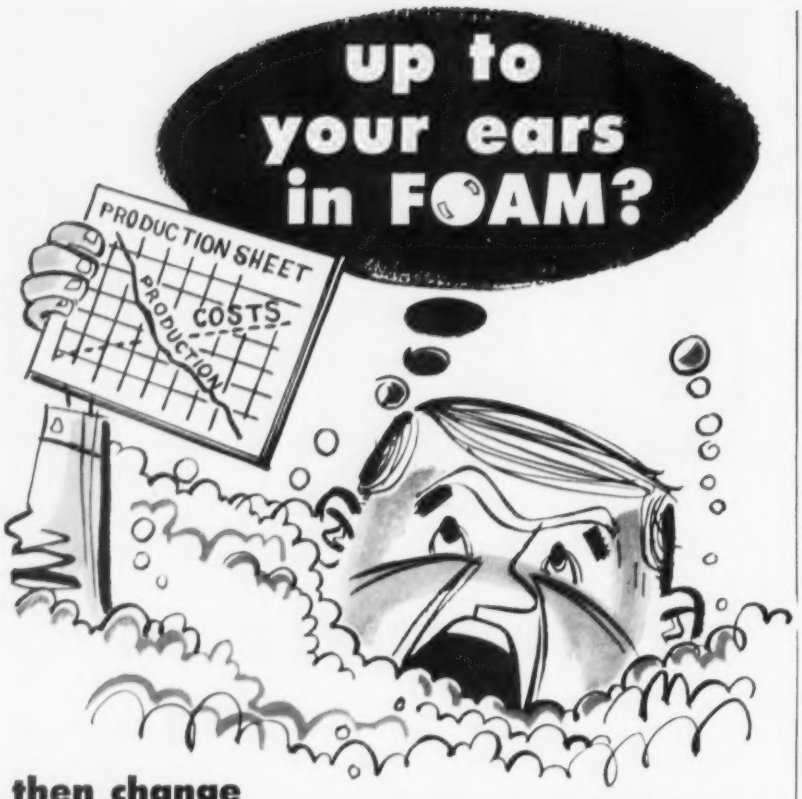
WHITE SOLID WOVEN COTTON BELTING • WATERPROOF AND WAX TREATED BELTING • PRESS-CURED KANRY-TEX BELTING • PLASCELL BELTING • CELLULOSE BELTING • STITCHED CANVAS BELTING • ROUND BRAIDED ENDLESS BELTS • HEVALOID ENDLESS BELTS • WOVEN ENDLESS BELTS • CLEANER AND SIFTER BRUSHES • WEBBINGS • HOISTING SLINGS • BELT DRESSING

When you need belting, call a Globe engineer.

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK

KNOWN FOR QUALITY THE WORLD OVER

For more data, circle this page number on card at back →



then change to a Dow Corning SILICONE DEFOAMER

Why continue to let foam rob you of valuable processing space, inflate your costs, smother your production schedule? Why indeed, when only a teaspoonful of a Dow Corning SILICONE DEFOAMER will prevent mountains of that wasteful foam . . . help you operate at full capacity.

Now there are two Dow Corning SILICONE DEFOAMERS for food processors—both so efficient they pay for themselves many times over:

ANTIFOAM A Compound—permissible to use in processing nonstandardized foods at concentrations up to 10 ppm.

ANTIFOAM AF Emulsion (water dilutable)—permissible at concentrations up to 34 ppm.

And remember, when you use one of these economical silicone defoamers, you also free yourself from the worry and mess of unsanitary boilovers and the extra maintenance costs that result. So—stop choking on your FOAM problems—change to a Dow Corning SILICONE DEFOAMER.

FREE SAMPLE

Put Dow Corning SILICONE DEFOAMERS to the test. Use the coupon below or write on your letterhead to receive a free trial sample. No obligation, of course.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

3023

NAME _____

TITLE _____

COMPANY _____

CITY _____ ZONE _____ STATE _____

My foamer is

Oil system _____

Aqueous system _____

Other _____

Questions & Answers

records to your cost department and see what value they assign to the lost production.

Unless you are already operating at an exemplary level of mechanical efficiency, you probably will be surprised at the great potential savings lying within your grasp. For unscheduled interruptions of production lines can be reduced substantially through a full-scale PM program.

With this cost and savings ammunition, you should not have too much difficulty convincing your management that you too should enjoy the benefits so many competitors have found through sound PM programs.

Roast Beef Loaf

Question—How would we go about processing a roast beef loaf?

Answer—Grind through large lard plate 75 lb. of boneless chuck and 25 lb. of beef plate meat. Introduce meat into steam-jacketed kettle with sufficient water to cover, and bring to a boil. Now add 3½ lb. of salt, ½ lb. of white pepper (ground), 2 crushed bay leaves, 2 lb. of grated onions, 10 lb. of tomato catsup and 3 oz. of Worcestershire sauce.

Cook slowly until meat becomes tender, and transfer to a batch-type mixer. While mixing, sprinkle with 12 lb. of nonfat milk solids and add 40-45 lb. of broth from kettle. Mix thoroughly, and fill into 5- to 6-lb pans. After thorough chilling (when product sets firmly), stuff into artificial casing. *Formula by American Dry Milk Institute.*

Mushroom Chop Suey

Question—We'd like to extend our line of frozen, packaged Chinese foods. Can you offer a formula for mushroom chop suey?

Answer—Here's one you can change any way you want:

Cooked rice	52½ lb.
Veal (1-in. cubes)	17½ lb.
Pork (1-in. cubes)	17½ lb.
Chicken gravy	17½ lb.
Bean sprouts (not drained)	8¾ lb.
Mushrooms (sliced)	8¾ lb.
Chopped celery	7 lb.
Chopped onions	1¾ lb
Soy sauce	2⅞ lb.
Salt	To taste

The Yarway Impulse started a new era in steam trapping...

. . . it began in 1935, when Yarway applied a unique principle of thermodynamics to steam traps—and the Yarway IMPULSE Steam Trap was born.

Since then over 1,225,000 Yarway IMPULSE traps have proved themselves so well in service that today many other type traps are regarded as obsolete—an understandable reason why the Yarway IMPULSE type of steam trap is being imitated.

To industry, the Yarway IMPULSE trap makes possible a new high in thermal efficiency of equipment, a new low in trap operating maintenance . . . resulting in increased production and higher profits.

THE THERMODYNAMIC PRINCIPLE

This is the principle on which the Yarway IMPULSE trap design is based—that variations in temperature of water discharging through two orifices in series cause variations in pressure in an intermediate chamber between the orifices, and that these changes in pressure may be utilized to open and close the trap valve.

ONE MOVING PART

There is only one moving part in a Yarway IMPULSE trap—a small, stainless steel valve. The entire valve assembly can be replaced in 5 or 6 minutes. It is the simplest of all steam traps to service.

EQUIPMENT HOTTER, SOONER—STAYS HOT

At "start up" the little valve opens wide to discharge air and condensate continuously. This brings equipment into production in the quickest possible time. The valve then actually floats on the condensate load, maintaining highest, steady temperatures.

A YARWAY IMPULSE STEAM TRAP TO MEET EACH TRAPPING REQUIREMENT

Research and development in the Yarway Steam Laboratory, plus intensive field testing, have produced a line of steam traps—*all* of the Yarway IMPULSE type . . . to efficiently meet each of the following classes of trapping service:

Normal requirements for pressures up to 600 psi call for Yarway Series 60 and 120 IMPULSE Traps in six sizes, ½" to 2".

Light loads for pressures up to 600 psi call for the ½" Yarway No. 20-A and No. 120-A IMPULSE Traps.

Heavy loads for pressures to 600 psi call for the extra high capacity Series 40 Yarway IMPULSE Trap, available in five sizes, ½" to 2½".

Highest pressure and marine requirements up to 2500 psi are met by the Yarway Integral-Strainer IMPULSE Trap, in six sizes, ½" to 2", flanged, screwed and socket weld types.

PLUS ADVANTAGES

- Small size and light weight
- Easy, low cost installation
- Minimum maintenance
- Non-freezing
- Stainless steel construction
- No adjustment of valve or seat needed for any pressure
- Low initial cost

NATIONALLY STOCKED, SOLD AND SERVICED

Over 270 Industrial Distributors stock and sell Yarway IMPULSE Steam Traps . . . and over 35 Yarway field engineers are available to help you select the right steam trap for the job.

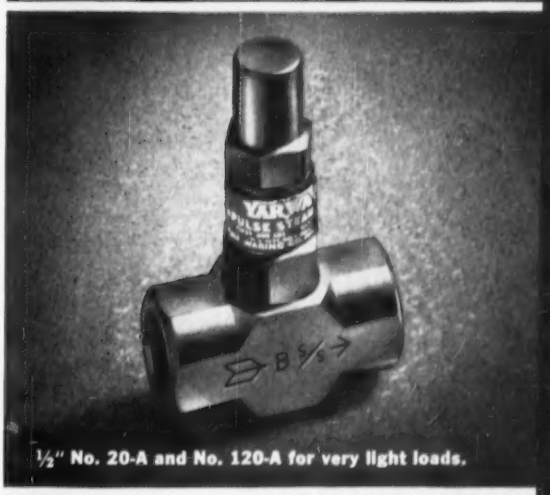
Write for free, new bulletin "*The Why and How of Steam Trapping.*"

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY *impulse*®

...a good way to specify steam traps

Series 60 and 120 for normal requirements.



½" No. 20-A and No. 120-A for very light loads.

Series 40 for very heavy loads.

Integral Strainer Impulse Traps for highest pressures and marine use.

NOW 3 SUPERIOR CORN SYRUP SOLIDS

carry the OK BRAND of QUALITY

1. OK DRI-SWEET 42 D.E.—(Granulated)
2. OK DRI-SWEET 42 D.E.—(Powdered)
3. OK DRI-SWEET Low D.E.—(Powdered)

for Better Conditioned, Finer Flavored Foods

OK DRI-SWEET 42 D.E. (GRANULATED) is especially suitable for seasoning comminuted luncheon meats, smoked, cured and preserved meats. It is colorless, reduces watering off, cuts shrinkage, improves texture, is a better binding agent and can be used in greater quantity for maximum fill.

But, whether you produce prepared meat products, dry food mixes, frozen foods, ice creams, soup mixes . . . if you want finer flavor, better texture, controlled moisture, increased solids, and improved shelf life . . . *if you want quality at no extra cost* . . . you can get it with the OK BRAND DRI-SWEET Corn Syrup Solids. In fact, *only* OK DRI-SWEET Corn Syrup Solids provide a combination of *so many advantages in a single conditioner-seasoner.*

Write today for detailed data on how OK DRI-SWEET Corn Syrup Solids can help you improve your production, or phone for a Hubinger Food Products Technician. You'll find him and the Hubinger Customer Research Service OK too.

HUBINGER QUALITY PRODUCTS 76 YEARS From CORN

The Hubinger Company

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NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA

Some insulations shrink, swell, warp, slump... fail in service...

FOAMGLAS®

INSULATION

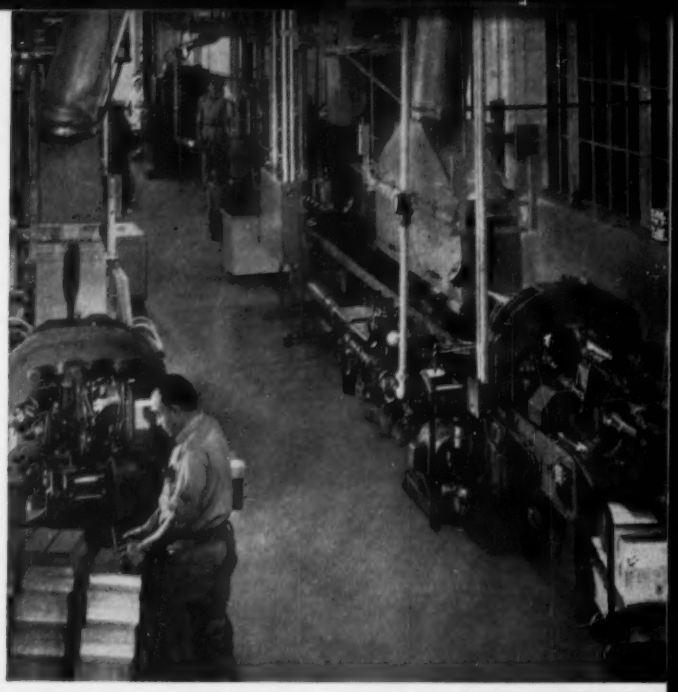
is dimensionally stable

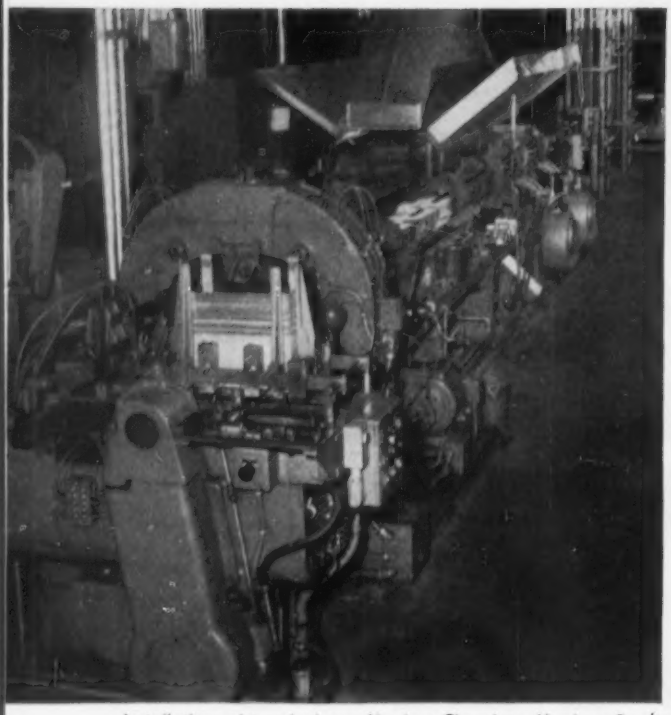
...Coefficient of expansion is only 0.0000046!

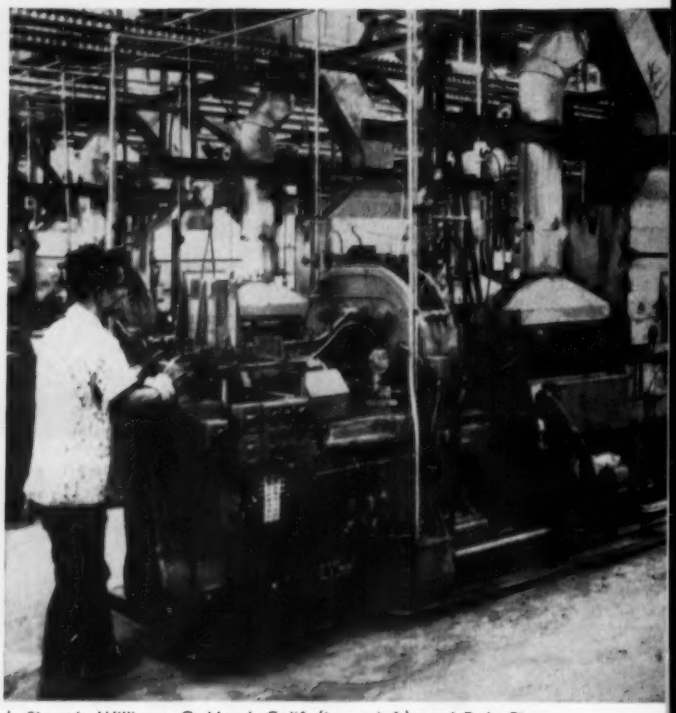
—and inorganic FOAMGLAS is strongest (compressive strength 7 tons per square foot)... waterproof and vapor-proof... can't burn... repels all vermin... easy, economical to handle and install. Write for detailed literature.

Pittsburgh Corning Corporation
Dept. O-117, One Gateway Center, Pittsburgh 22, Pa.
In Canada: 57 Bloor Street West, Toronto, Ontario

Hamilton new 501 bodymakers are in service at many well-known plants







Installations pictured above, Hershey Chocolate, Hershey, Pa. (top); Sherwin-Williams, Oakland, Calif. (lower left); and Dole Pineapple Honolulu, indicate how leading packers have chosen Hamilton's new 501 Bodymaker to meet can requirements efficiently.

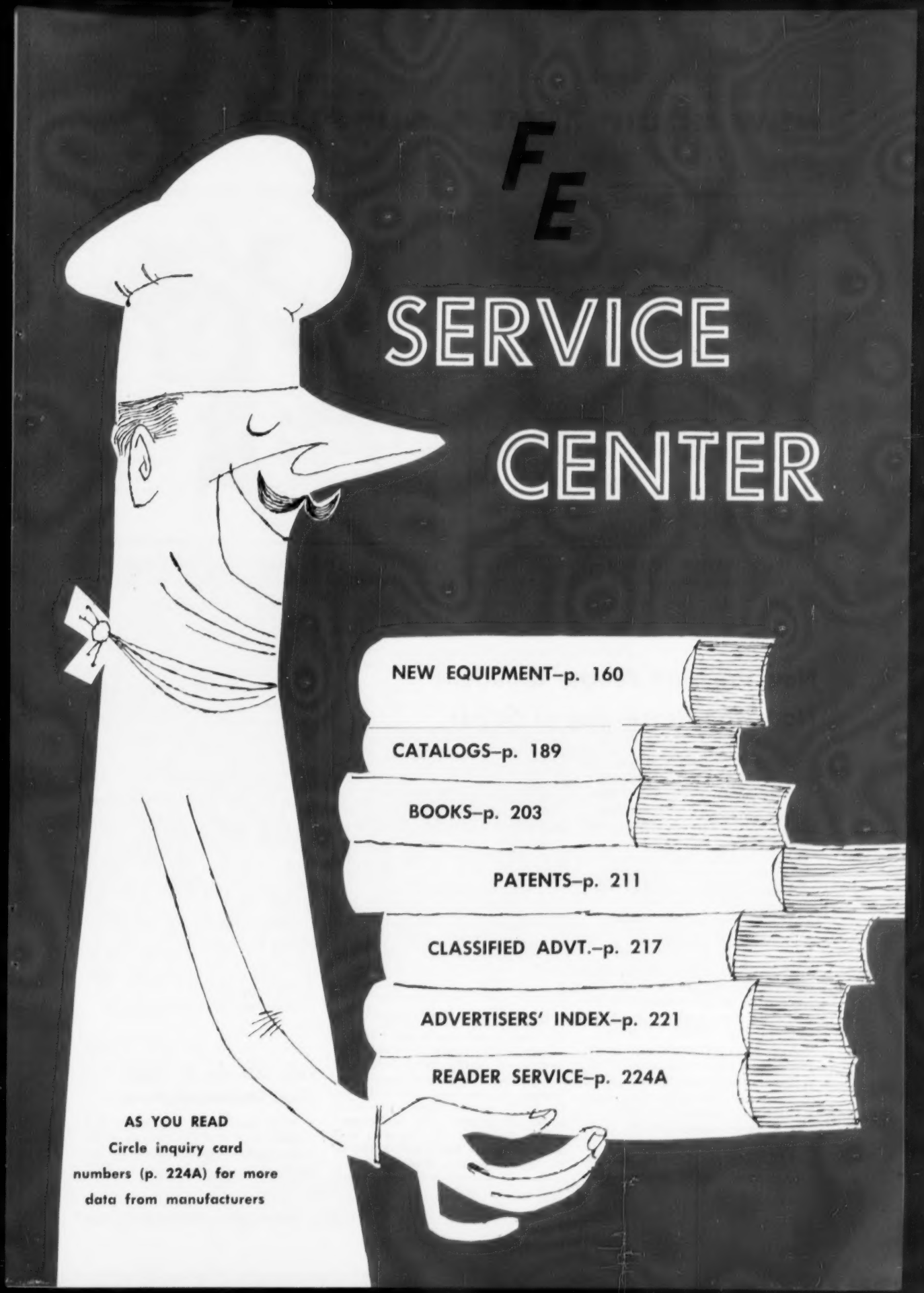
The main feature of Hamilton's new No. 501 Bodymaker is its central drive shaft. This unusual design results in fewer wearing parts and gears and improved accessibility.

Write today for a descriptive bulletin of the world's most complete line of can making machinery.

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools


FE
SERVICE
CENTER
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AS YOU READ
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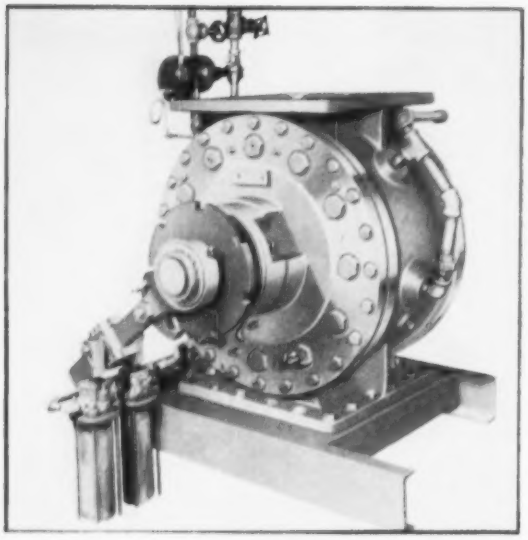
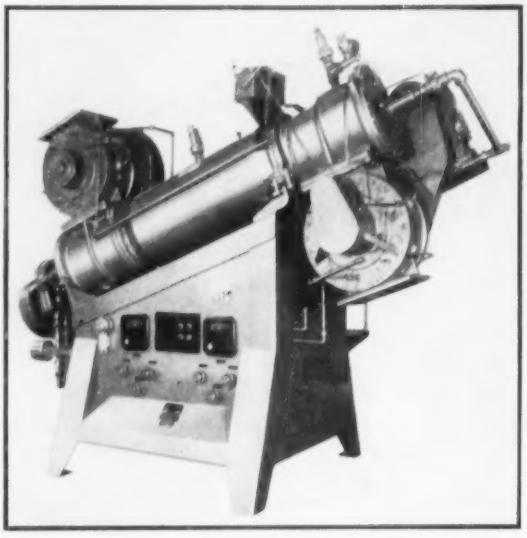
NEW EQUIPMENT & SUPPLIES



COMPACT PRESSURE FEEDER ups efficiency and flexibility in continuous pressure-cooking of fruits, vegetables, and cereal grains.



COMPLETE SETUP: Jacketed stainless-steel pressure vessel processes solids to 5-in. dia. in 120-psig. steam. Exposure times range 2-11 min.

New Pressure Feeder Broadens Non-Stop Processing of Solids

Designed to transfer material in and out of steam atmospheres up to 120 psig., this precision feeder offers numerous applications in continuous pressure cooking and aqueous extraction of solids.

Combined with maker's pressure vessel, the unit (Transol 120) converts many batch-rotary or fixed-bed solid processes to continuous high-capacity production (steam or gas) with operating temperatures up to 350F.

Such equipment is already handling a wide variety of fruits and vegetables, in some cases with lye. And it has been used for continuous steam-pressure cooking of wheat.

Moreover, experimental data are available on aqueous pressure extractions of other granular materials, and on cooking of such items as rice, oats, barley, corn, and hominy grits.

The feeder, which can be made either of steel or stainless, meets ASME code specifications for unfired pressure vessels. In one revolution, it delivers 1.5 cu. ft. of solids to or from the vessel.

Feed and discharge apertures are 9½ in. square. Housing is 29 in. dia., and adaptors are available to fit its square flange to round pipe flange. Four accesses are provided in the housing to relieve pressure, or to feed back pressure to pockets.

In operation, discharge pressure may be gradually lowered through these openings, or they may be sealed off for instantaneous pressure drop where mechanical effect of blast is desired. Feeder's pump is pneumatically driven with a rotation-time cycle controller. Motor drive can also be provided.

Illustrated pressure vessel, equipped with external jacket, continuously processes solids from 4-5 in. down to ¼-in. mesh granular material. Exposure time ranges 2-11 min.

Steam entry is through hollow shaft of stainless unit, which can be sized to various capacity and exposure requirements. Rotation is provided by motor drive. Both the jacket and interior of unit are tested in excess of ASME specifications.—*Food Machinery & Chemical Corp., Canning Machinery Div., P. O. Box 1120, San Jose, Calif., or 103 E. Maple St., Hoopeston, Ill.*

Circle 160A on Reader Service Card

Want More Information?

It's free — and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard — back of book. Then sign at the bottom and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.

Solar-Selecting Skylight Gives Optimum Lighting

Now available to food plants is a prefabricated skylight offering maximum uniform illumination to cut lighting costs. In addition, it elimi-

nates glare and reduces solar heat transmission during summer months.

Unit (Toplite) employs solar-selecting prisms which "open" and "close" to admit only cool light, while rejecting hot rays. Installed along the north-south axis of a building, prisms remain "open" on their north sides to transmit daylight in all seasons. However, south sides "open" and "close" according to season, time of day, and sun's position. During spring and summer months, hot sunlight is rejected while cool north light is admitted.

Panels are supplied in five sizes ranging 2x2 ft. to 6x3 ft., and in two models—a flanged type installed directly on the roof deck, the other for installation on prepared masonry, wood, or metal curbs.—*Kimble Glass Co., Toledo, Ohio.*

Circle 160B on Reader Service Card

Moisture Rapidly Gaged By Direct-Reading Unit

This moisture analyzer gives a quick check of any material that can be safely dried by heat.

Unit (I-R Moisture-Matic Balance) has a motor-driven torsion balance that automatically weighs samples after test and shows percent moisture directly on a counter. Operator need only load pan and set the drying time.

For highest absorption and rapid, even heating, a special infra-red element is employed. Heat level is variable between 30 and 600w.—*American Hospital Supply Corp., Scientific Products Div., 2020 Ridge Ave., Evanston, Ill.*

Circle 161A on Reader Service Card

Portable Electronic Computer Minimizes Paperwork

Ease of operation and adaptability to a wide variety of problems are advantages cited for this desk-side electronic computer.

Called 610 Auto-Point, portable unit handles tasks from sales forecasting to heat-transfer calculations, which formerly required much larger machines. Providing automatic positioning of the decimal point, it does 214 additions or subtractions and 52 divisions or multiplications per min.

Computer employs magnetic drum 'memory'. It is self-contained from initial programming to final output on punched tape or high-speed electric typewriter. Special electronic circuitry guards against operating errors, and a visual display unit shows any number stored in machine.

No air conditioning is necessary for the computer, which may be leased or purchased.—*International Business Machines Corp., 590 Madison Ave., New York City.*

Circle 161B on Reader Service Card

High-Capacity Van Has Small-Truck Advantages

Advanced design of this truck body offers operators of large vans (with heavy payloads) the maneuverability and load-access advantages of a smaller, forward-control parcel delivery models. Typical applications include delivery of baked goods, meats, and dairy items. (*turn page*)

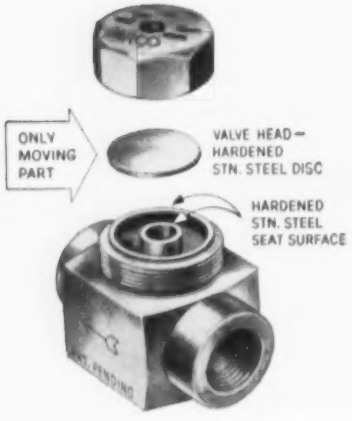
CUT OUT AND FILE

End these steam trapping problems!

1. High maintenance cost
2. Too many sizes and pressure ratings
3. Steam blowing on light load
4. Limited installation space
5. Pressure variations
6. Corrosion
7. Air binding
8. Freezing

ACTUAL SIZE

HERE'S HOW...
with the versatile Sarco TD Thermodynamic Steam Trap



ONLY 3 PARTS
SIMPLE — TROUBLE-FREE

All parts machined from stainless steel bar stock. Only moving part — a solid hardened stainless steel disc — practically wear-proof.

No mechanism — the kinetic energy of steam closes the valve. No narrow channels to choke. No gaskets to leak.

1. **Practically eliminates maintenance** — as shown, left, the TD has only 3 simple, rugged parts — all stainless steel. No mechanism . . . to wear or malfunction. Highly resistant to superheat, water-hammer, corrosive condensate.

2. **One trap for all pressures** — 10 to 600 psi — for light or heavy loads. Self-adjusting — each size Sarco TD uses same large capacity seat for all pressures—without change or adjustment.

3. **Won't blow steam on light loads** — no prime to lose — no adjustments.

4. **Small as a tee fitting** — ½" size, for example, only 2¼" long, 1¾" wide, 2⅛" high.

5. **Operates perfectly when pressure fluctuates** — absolutely no effect from 600 to 10 psi! No water seal to evaporate. No adjustments.

6. **Unaffected by corrosive condensate** — made of stainless steel throughout.

7. **No air-binding** — discharges at steam temperature and vents air and air-steam mixtures at start-up and during operation.

8. **Freeze-proof** — self-draining when installed with outlet down.

60-DAY TRIAL CONVINCES

We will gladly send you a Sarco TD steam trap and strainer for 60-day trial. No cost or obligation. You buy *only* if completely satisfied. Advise size — ⅜, ½, ¾ or 1" — and application. Sarco Company, Inc., 635 Madison Ave., New York 22, N. Y.

2217-B

SARCO Thermo-Dynamic TRADE MARK **STEAM TRAP**

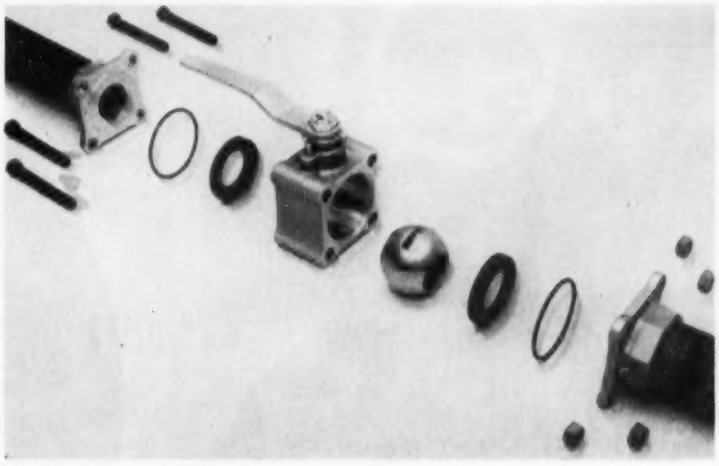
THE MODERN STEAM TRAP — THAT CAN DO MORE THINGS BETTER!

Unit (Merchantvan) is about 3 ft. shorter than the conventional cab and chassis of the same capacity with van body attached.

Interior load space on all vans up to 18 ft. long is 88½ in. wide and either 78 or 84 in. high. Driver enters the van from the cab and makes deliveries through cab's two side folding doors, which have convenient step wells.

Cab is specially equipped for driver convenience and safety. For quick servicing, a hinged floor in cab gives access to emergency brake, battery, and transmission. In addition, an easily removed radiator-door and grill assembly, and a hinged engine cover, expose the engine.—*Boyertown Auto Body Works, Boyertown, Pa.*

Circle 161C on Reader Service Card



Double-Duty Valve Offers Simple In-Line Maintenance

Combining a union and a ball valve in one compact, double-duty unit, this new valve eliminates the need for a separate union in a line to provide a break point. It also enables simple in-line maintenance, replacements being made just by removing four bolts and lifting the center section (which contains all renewable parts) from the line.

Employing quarter-turn operation, valve (Union-Ball) offers leakproof shut off and two-way flow. Smooth openings in the ball and seat rings minimize resistance to flow. And performance is unaffected by a reversal of flow.

Metal components may be bronze, aluminum bronze, or aluminum with carbon steel, and units will soon be available in Types 303 and 316 stainless steel. To accommodate a wide range of media, seat and seat materials are made of buna-N, Hypalon, Neoprene natural rubber, or Teflon.—*Worcester Valve Co., 20 Parker St., Worcester, Mass.*

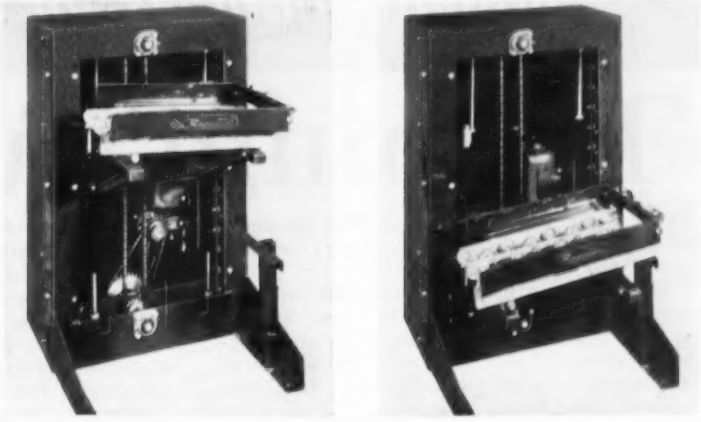
Circle 163B on Reader Service Card

Tank's Design Simplifies Mixing of Viscous Items

Thorough mixing of viscous products and efficient heat transfer are advantages reported for a new line of stainless cone-bottomed tanks. Capacities of the units range 300-800 gal.

Typical items handled are meat- and fruit-pie sauces, cultured cream and buttermilk, custards, gravies, and mayonnaise. Jacketed unit (E.C.) has scraper-blade agitator that contacts both sides and bottom of vat, and center outlet for complete emptying.—*Cherry-Burrell Corp., 427 W. Randolph St., Chicago.*

Circle 163A on Reader Service Card



Transfer Unit Reverses Case Flow in Minimum Space

Employing an automatic vertical lift, this conveyor-line transfer unit reverses the direction of carton flow without use of 180-deg. curved sections—a particular advantage where space limitation is a problem.

Unit (Vertical Transfer) operates between two conveyors with ends in a common vertical plane. Lines are spaced to allow clearance for materials handled.

In operation, a carton coming from the upper conveyor trips a starting switch as it flows onto a wheel

Titanium Tubing

For processing lines carrying fluids of an extremely corrosive nature — look to *Contour Trentweld* titanium tubing for reliable service.

This titanium tubing is completely uniform throughout any cross-section. The weld zone is free from bulging weld bead because Trent's exclusive process — performed with the weld area at the bottom — forms the molten weld metal into the shape of the tubing.

And, with titanium, you get the unique advantages of a tubing that's strong as steel but 44% lighter . . . virtually immune to a broad spectrum of corrosive materials . . . entirely free from stress-corrosion cracking.

So, next time you need a strong, light, extremely corrosion-resisting tubing — try *Contour Trentweld* titanium tubing. And remember, it's made by Trent — tube mill specialists.

CONTOUR TRENTWELD®

Stainless and High Alloy Welded Tubing

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of Crucible Steel Company of America)

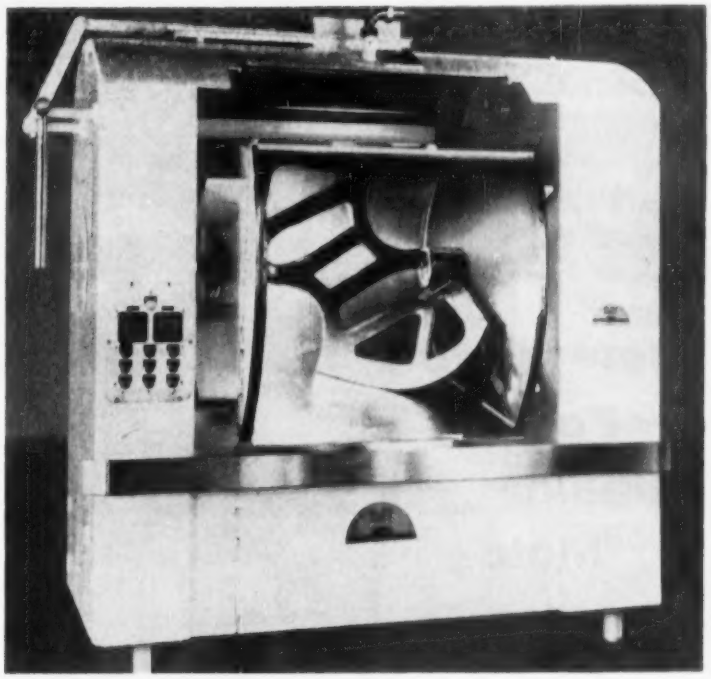
conveyor section mounted on the lift platform (left photo). Then, platform lowers to bottom-conveyor level and automatically tilts (right photo) to start the carton in the opposite direction. As carton leaves the platform, it trips a limit switch which returns lift to upper level.

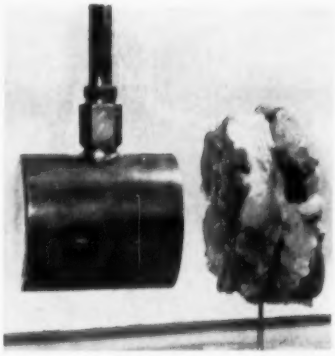
Succeeding cartons on upper track are held back by an automatic stop, which is operated by lift platform.

Designed for light to medium loads, unit can be used with gravity or power-driven conveyors, in descending or ascending lines of flow. And it can feed to or from two or more levels of conveyor track. The transfer equipment is custom-designed for each application.

Drive system is engineered for maximum speed flexibility, and lift's open-frame construction simplifies inspection and maintenance.—*Rapids-Standard Co., 342 Rapistan Bldg., Grand Rapids, Mich.*

Circle 163C on Reader Service Card





New Ultrasonic Process Makes Foods Tender

Ultrasonic waves are now being used to tenderize foods, the process reportedly transforming tough and fibrous meats, fish, poultry, and produce into succulent, digestible products.

In operation, foods are first frozen to retain their shape and natural juices. Frozen item is then immersed in a water-filled tank and subjected to ultrasonic vibration. A transducer generates sound energy in the ultrasonic range.

Equipment is built to user's specifications.—*Reflectone Corp., Boston Post Rd., Stamford, Conn.*

Circle 165A on Reader Service Card

Triple Advantages Reported For New Dough-Mixer Line

Highest standards of sanitation, safety, and performance are cited for this new mixer, available in three sizes with either a single-speed or two-speed motor drive. For easier cleaning, unit (Continental) employs a simple retractable shaft seal that can be detached quickly with flip-open handle, no tools required. Its one-piece aluminum flour gate, cast-aluminum hopper, and stainless water inlet are easily removable for cleanup.

Bowl and canopy are made of stainless steel, polished, and with round corners.—*J. H. Day Co., 4924 Beech St., Cincinnati.*

Circle 165B on Reader Service Card

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High-Ratio Reduction Drives Cut Operating Costs

Savings in space and motor cost are reported with use of new high-ratio double-reduction drives.

All-steel units (Shaft Mounted Drives) are offered in ratios of 24:1, or 20:1 in two smaller sizes. Outside dimensions and torque ratings, however, have not been changed. These drives now permit use of smaller sheaves for a given output speed and lower output speeds from a standard 1,750-rpm. motor.

Units are available for both horizontal and vertical applications, in ¼-30 hp., and with output speeds down to 5 rpm.—*Falk Corp., 3001 W. Canal St., Milwaukee.*

Circle 165C on Reader Service Card

Here's a promise of new protection for a wide variety of food products. Extensive tests have proved that Pfizer SORBISTAT (sorbic acid) selectively inhibits the growth of many molds, yeasts and certain bacteria which cause spoilage.

Cheese and cheese products, prepared gelatin, fruit, vegetable, and other salads, and fruit cake are some of the foods for which sorbic acid protection has been evaluated and found effective. The protective value of sorbic acid in pickles, soft drinks, pie fillings, and chocolate syrup is now being carefully analyzed. Reports indicate that in certain cases, sorbic acid is several times as effective as other antimycotic agents now in use.

Most important, since SORBISTAT is a selective growth inhibitor of yeasts and molds, it does not interfere with the normal microbiological curing of cheeses. At normally effective use levels SORBISTAT does not affect the appearance, taste or odor of any food product. It is a stable, easily stored, white crystalline powder that's added to foods as a powder or as an easily prepared solution.

Discover for yourself how SORBISTAT can keep your foods in better condition... and your customers better satisfied! Write for technical literature and sample today.

Quality Ingredients for the Food Industry for Over a Century

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Quickly Checks Water For Hardness

Where water of known ionic purity is required, this conductivity instrument offers quick and economical analysis.

Called Ionimeter Model CT-21, it employs a D'Arsonval meter with direct-reading dial that is graduated (0-50) in parts per million as NaCl. Or in terms of electrical resistance, 5,000,000-0 ohms.—*Crystal Research Laboratories, 29 Allyn St., Hartford, Conn.*

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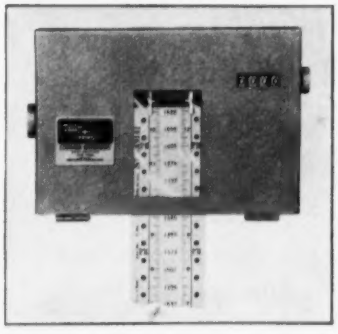

Print-Out Counter Monitors Output, Traffic, Operations

Accurate print-out (at predetermined intervals) of elapsed time or number of units produced is reported with use of this precision control instrument. Resulting data enable pinpointing of production bottlenecks, analyzing equipment, methods, and personnel, also accurate cost-accounting and maintenance.

Called Tally-Print, it is electrically connected to the machine, conveyor line, or process to be monitored. In

Nerco-Niro®
Spray Drying
Preserves
Flavor—Aroma—
Inherent Food Values

Nerco-Niro's gentle action effectively dries heat-sensitive foods without altering or impairing taste, aroma or nutritional values. Nerco-Niro design, based upon world-wide experience in processing many foods, does away with hot metal surfaces, dries in seconds, easily, efficiently.

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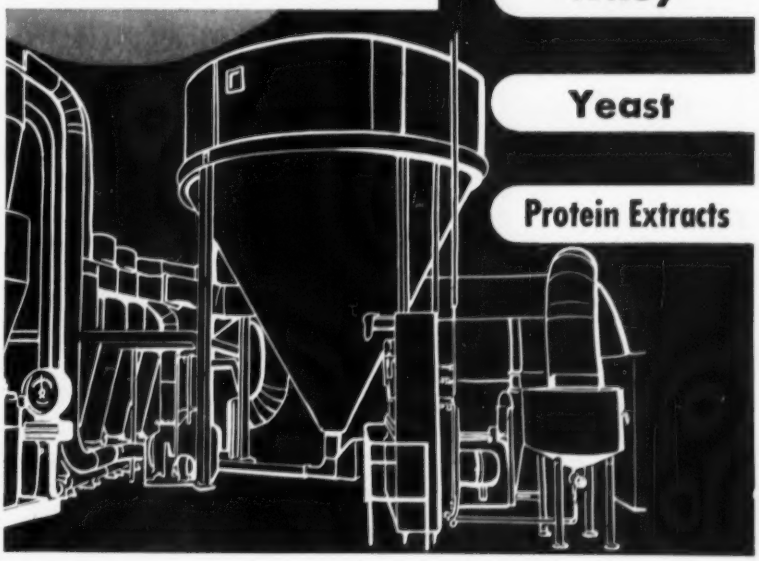

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CATCH THEIR EYE

with colorfully PRINTED PATAPAR® WRAPPERS

Wet-strength, grease-resisting wrappers of Patapar Vegetable Parchment do more than just protect the product. They add glamour and sales appeal!

Exquisitely printed in eye-compelling colors, Patapar is outstanding for packaging butter, ham, bacon, cheese, margarine, shortening, poultry, sausage, nursery stock, flowers and many other products.

Our plants are completely equipped for printing Patapar in full color—by letterpress or lithography. Inks used are color-fast and NON-TOXIC.

We will reproduce your present wrapper design, or we'll create a colorful new design for you with any wording you wish. No charge for typesetting.

Want us to show you? Just tell your requirements and send us a sample of your present wrapper.

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Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

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Sales Offices: New York, Chicago
West Coast Plant: Sunnyvale, California

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

Equipment & Supplies

operation, a chronologically marked chart roll is sprocket-driven through the instrument. Thus, total elapsed time or total number of units monitored in a predetermined interval is printed on the tape. In addition, a visual cumulative total is provided for longer periods.

Unit is available in 4 models and in 5-digit or 4-digit printers with standard print-out intervals of 5, 15, 30, or 60 min. (Special intervals can be supplied if desired). It registers up to 300 impulses per min., and is actuated by closing external contacts.

Chart roll tapes are 250 ft. long, require no ink, and are available in speeds from 1-12 in./hr.—*Standard Instrument Corp., 687 Broadway, New York City.*

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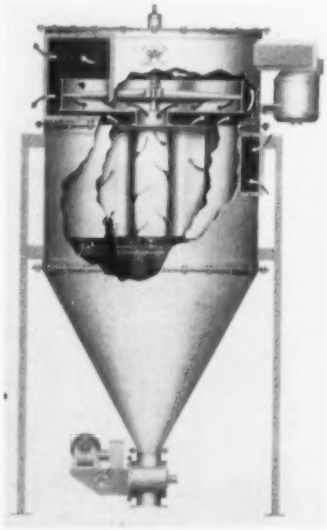

New Dust Filter Provides Double-Action Control

For efficient dust control (99.99+%), this modified unit combines a cyclonic separator with a high-efficiency filter. Typical application: Separating products in pneumatic conveying.

Known as "RJ," unit is designed for continuous-automatic operation. It employs high-velocity reverse air cleaning (Hersey principle), but differs from former designs in that dust is deposited on the outside of filter sleeves, which have inner liners.

As shown in photo, dust-laden air travels in a cyclonic path, depositing heavy particles before entering the

5 ways TOLEDO HI-WEIGH TRUCK SCALES

can help your business grow

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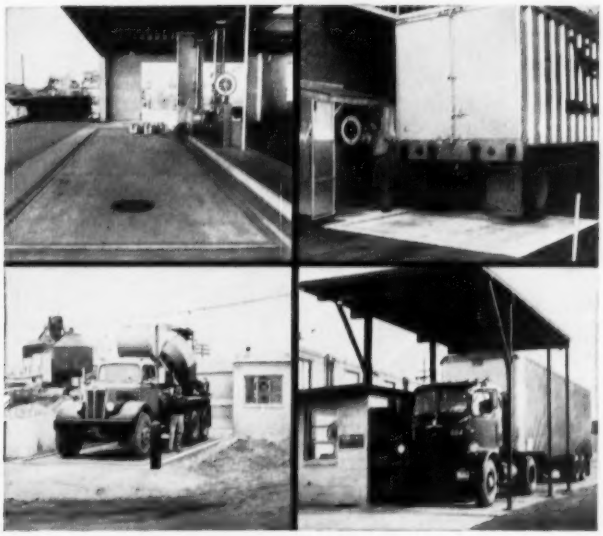
with New TOLEDO PRINTWEIGH
Features full-figure printing for each 10 pounds from zero to 50 tons. Prints weights on tickets, strips or sheets. Avoids human errors.



There's a Toledo Hi-Weigh Truck Scale for your needs—full range of capacities and platform sizes.

1. *Prevent overweight fines and delays. You know your load* when you weigh on Toledo Hi-Weigh Scales!
2. *Protect equipment and prevent cargo damage en-route.* It's easy to keep loads within vehicle ratings—and achieve correct weight distribution—with Toledo Hi-Weigh Scales.
3. *Prevent weighing errors.* Rugged, reliable Toledo Hi-Weigh Truck Scales are known for precision performance under tough, truck-weighing conditions.
4. *Prevent loss of revenue.* Toledo Hi-Weigh Scales furnish accurate weight data so vehicles can roll with maximum payloads.
5. *Insure that weights are as billed* on outgoing and incoming shipments . . . and so protect customer good-will while providing accurate weight data on materials received.

There's a Toledo Hi-Weigh Truck Scale to suit your needs exactly. Full range of capacities to 60 tons; lengths to 60 feet. Two section, four section and axle load models. All feature advanced Toledo engineering, with integrated lever, weigh-bridge and pit for brute-strength with long-life accuracy. Also Toledo Electronic Scales—no mechanical connections between platform and scale head. Locate dial wherever desired. Ask your Toledo representative for full information, or send for literature.

Request Form #2417.
Toledo Scale Company, Toledo 13, Ohio.

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200 Cities

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Headquarters for Scales

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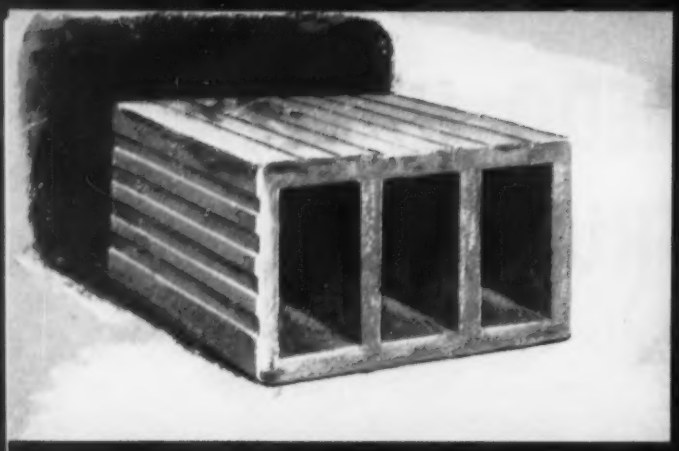

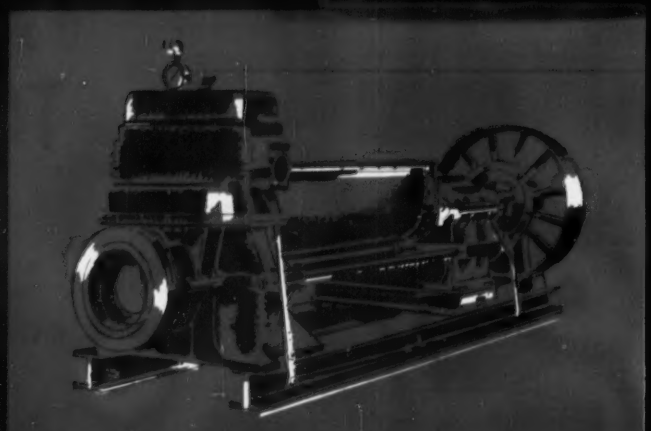

No Margin for Air— No Margin for Error

ANOTHER DRIVE REQUIREMENT MEETS ITS MASTER

Yes, it's a fact—unless you remove the air from the clay, you get a no-good tile. And whether air is your problem, or not—error is always a problem. And it's never a mistake to come to Master for the right power drive. In every kind of industry, Master customized package drives give you the utmost in flexibility, compactness and performance.

Here, the primary requirement is power—and the husky, big 200 H.P. Master fills the bill year in and year out. Your requirements might be better met by integrating Master components into a single, efficient, compact unit for the right horsepower, right shaft speed and right mounting features. What are they?

A husky 200 H.P., 440 volt squirrel cage induction Master Motor powers this 14-ton De-Airing Brick and Tile Machine with a capacity of over 8000 bricks per hour. Two parallel shafts carrying pug knives work clay, pass it into vacuum chamber with auger cylinders where it is finished and discharged.

Motor Ratings	⅛ to 400 H.P. All phases, voltages and frequencies.
Motor Types	Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.
Construction	Open, enclosed, splashproof, fan-cooled, explosion-proof, special purpose.
Speeds	Single-speed, multi-speed, and variable speed.
Installation	Horizontal and vertical, with or without flanges and other features.
Power Drive Features	Electric brakes (2 types)—5 types of gear reduction up to 432 to 1 ratio. Mechanical and electronic variable speed units—fluid drives—every type of mounting.

MASTER

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

filter chamber where "fines" are removed. Product discharge is handled by maker's rotary valves, and cleaning is accomplished without shutdown.

All of unit's moving parts are located on the clean-air side, which minimizes maintenance. Felted filter media are used for sleeves because of their efficient filtering of sub-micron particles and ability to handle high loads.—*The Day Sales Co., 810 Third Ave., N. E., Minneapolis.*

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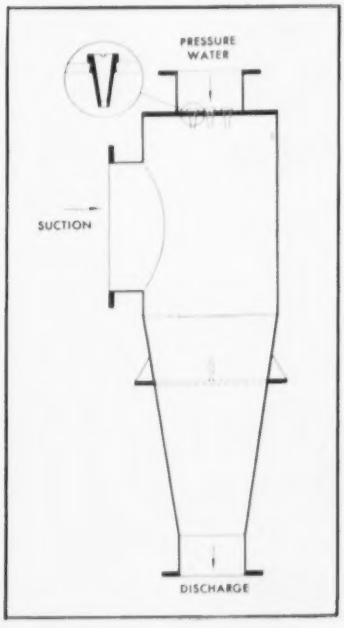

New Barometric Exhauster Cuts Air-Handling Costs

Design of this exhauster, which takes advantage of a barometric discharge leg, cuts water requirements to permit economical handling of high air volumes.

Known as Hydro-Vac, unit is suitable for evacuating and priming a closed system, such as turbine condensers before sufficient steam pressure is available at startup; handling non-condensables at low absolute pressure, such as in deaerating water; and mixing gases with liquids.

As shown in diagram, exhauster operates on a jet principle. Water, under pressure, enters top of unit, passes through nozzles, and entrains air or gases through the side suction inlet.

Air is thoroughly mixed with water

BE SURE OF A PERFECT CONICAL SHAPE SPRAY ALL THE TIME WITH *Monarch*

For a perfect spray. Many food processing plants prefer Monarch nozzles.

This advanced design nozzle reduces clogging and guarantees dependable food processing applications to

- WAX FRUITS
- RINSE VEGETABLES
- POWDER MILK
- DRY EGGS
- WASH FILTER CAKE
- HUMIDIFY BANANA ROOMS

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Outstanding Accuracy
PALMER
Dial Thermometer

Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

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THE WATER GEL YOU'VE WANTED!

clear and tender

to firm and strong

ALGIN WATER GELS

for foods, pharmaceuticals, industrial uses

If you are seeking a new gel possessing different and improved properties, an algin water gel may well prove to be your answer. For you can produce these unique hydrophilic colloid gels tender and soft or firm and strong. They are clear, do not melt, and may be acid or alkaline. You form them with or without additional solids, make them with hot or cold water or milk to set at room temperatures or refrigerator temperatures. Small wonder algin gels are now finding wider and wider use. Surely they are well worth your own test and evaluation.

YOURS ON REQUEST: Technical Bulletin describing properties, preparation and use of gels made from unique Kelco Algins.

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and both are discharged through the tail pipe. Latter should be installed in a straight vertical position at a height sufficient to overcome barometric pressure (at least 34 ft. under most conditions.) When properly installed, unit needs no pump and discharge line.

Exhausters are made in eight standard sizes.—*Schutte & Koerting Co., Dept. JA-9, Cornwell Heights, Bucks County, Pa.*

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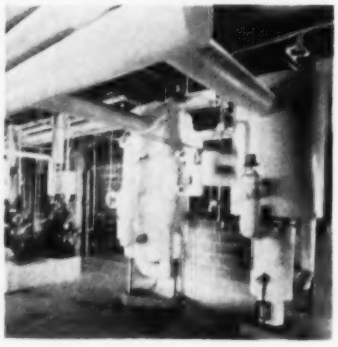

New Plastic-Type Insulation Is Efficient, Easily Applied

Wide food-industry use is seen for new lightweight pipe-and-fitting insulation that sharply cuts refrigeration losses.

Called "Cold-Pruf," it is made of expanded polystyrene (Styrofoam) and prefabricated in a variety of thicknesses and shapes. Installation by plant personnel is termed quick and simple, since product can be cut on the job with an ordinary knife or saw. It can be installed directly on wet lines and because of its light weight, can be made in fewer, larger pieces, which further cuts costs.

Material has high compressive strength and is not affected by sudden temperature changes. It can be used effectively for pipes and vessels within −400F. and 180F. Fire-resistant and moisture-proof, it also resists mold, rot, and vermin.

Pipe, vessel, and fitting covers are supplied in standard sizes and in 8 thicknesses. Also provided are galvanized steel bands, and ground polystyrene for filling. A special coating for color coding in National Safety Council approved colors is optionally available.—*Creamery Package Mfg. Co., 1251 W. Washington Blvd., Chicago.*

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NEW 1958 CHEVROLET TRUCKS WITH NEW HUSTLE! NEW MUSCLE! NEW STYLE!

Just look at all they offer that's new and better . . . and you'll see why these new Chevies are the fleetest, sturdiest, handsomest dollar-savers yet! Meet Chevrolet for '58!

NEW LIGHT-DUTY APACHES

Thrifty Apaches offer three new Step-Vans complete with walk-in bodies. With high-capacity panels, pickups and four-wheel drive models, this expanded light-duty lineup has a dollar-saving answer to your delivery chores.

NEW MEDIUM-DUTY VIKINGS

Hardy Vikings roll in with nine brand-new models, offering new cab-to-rear-axle dimensions for improved semi-trailer, dump, stake and van-type operations. Options available boost GVW ratings all the way to 21,000 lbs.

FAMOUS 6's OR SHORT-STROKE V8's

The engine lineup is full of new pep and power—whether you choose a 6 famous for economy or a high-compression V8. Look over Task-Force 58 at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET

SEE THE LATEST EDITIONS OF THE "BIG WHEEL" IN TRUCKS — 1958 CHEVROLET TASK·FORCE TRUCKS

Primex
ARM & HAMMER BRAND
1/2 BAKING SODA
10 GIANT
Tide
THE WASHDAY MIRACLE
FOR EASY PRICE MARKING
FOLLOW DIRECTIONS ON OPPOSITE SIDE
12 20 oz.
313
Yellow
"WHEREVER PARTICULAR PEOPLE CONGREGATE"
PALL MALL
FAMOUS CIGARETTES
OUTSTANDING- AND THEY ARE MILD!
The American Tobacco Company
OASIS FILTER CIGARETTES
SISVO
10M
20's
OASIS
FILTER CIGARETTES
CAMEL
CIGARETTES
60 CTNS.
12 M.
12 Packages 2 lbs. each
New PURINA DOG CHOW
OREO
CHESTERFIELD KING
12M
20's
CHESTERFIELD KING
CIGARETTES
WOODBURY
BEAUTY and DEODORANT
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MORTON
IODIZED
SALT
WHEN IT RAINS IT POURS
418
Quaker
QUICK GRITS
THE QUAKER OATS COMPANY, CHICAGO, U.S.A.
WOODBURY
XL7
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SOAP
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"IT'S TOASTED"
new pink dreft
24 REGULAR
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Leading brands of packaged goods are protected by Mead container board

Lots of good things come in small packages, but they travel safely to their destinations in large containers made of good container board ... the kind The Mead Corporation makes.

Mead virgin kraft liners and Chestnut semi-chem corrugating medium have long been recognized for their superior quality — quality that has come about through years of intensive research on better container materials and testing methods. For example, Mead developed the first method of predicting at the mill level the results that can be expected when a given roll of corrugating material is fabricated. Today this technique is standard practice through the industry.

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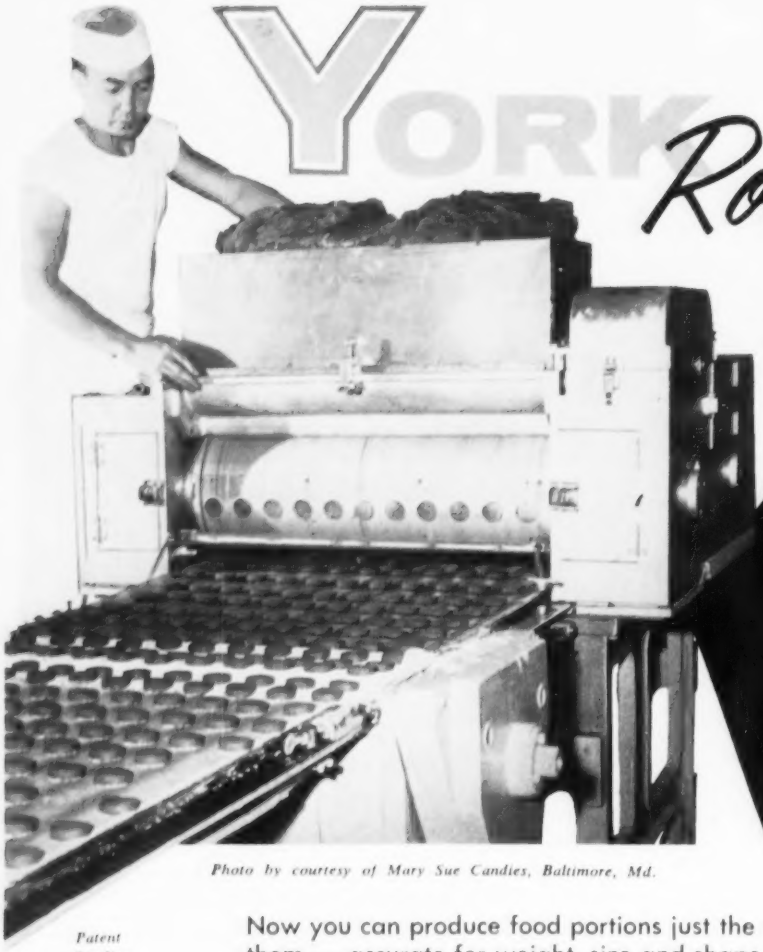
MEAD
container board



YORK Rotary Portion Former

Cuts Costs... increases production of uniform portions.

Photo by courtesy of Mary Sue Candies, Baltimore, Md.

Patent Pending

Now you can produce food portions just the way you want them — accurate for weight, size and shape and uniformly ejected in unsurpassed quantities per minute — with the York Rotary Portion Former.

- **Operating on a new principle, the York Portion Former does not extrude but forms and shapes each portion individually.**
- **Vacuum forming prevents damage to the most delicate ingredients so that a wide variety of foods and food mixtures may be used.**
- **Can deposit 1800 small pieces per minute and handle 2500 lbs. of material per hour. Each machine is equipped with a variable speed regulator.**
- **Continuous operation through to fryer or freezer requires no storage between processing stages. Saves valuable plant space.**
- **Cuts costs, too! One York Rotary Portion Former paid for itself in only four months, through reduced labor time and costs.**

York Rotary Portion Formers are available in three sizes: 16", 24" and 32" widths.

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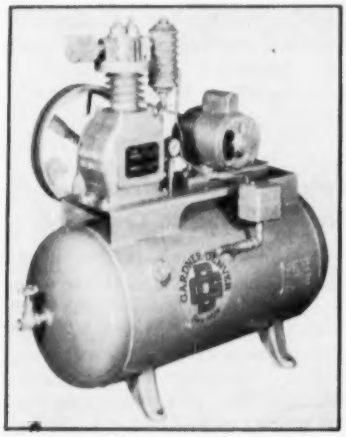


Space-Saving Unit Delivers Oil-Free Air at 4-5 Cfm.

This compact compressor, a single-stage air-cooled unit, supplies oil-free air for numerous uses in food processing and instrument control.

Employed in the cylinder are carbon parts which require no oil or water lubrication. Available base- or tank-mounted, unit (CACB) delivers 4-5 cu. ft. of air per min., and is suitable for discharge pressures of 40-100 psi. Automatic start and stop controls are supplied as needed. —*Gardner-Denver Co., Quincy, Ill.*

Circle 177A on Reader Service Card

INGREDIENTS

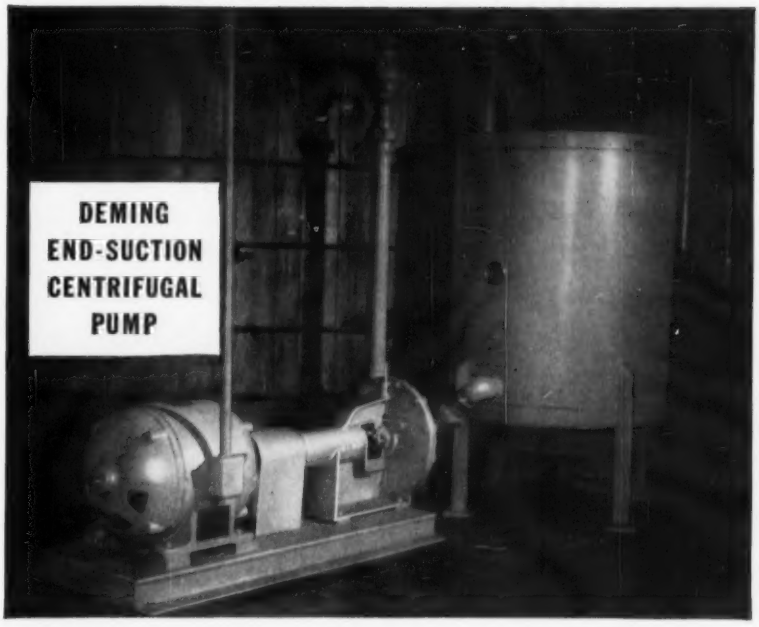
Four Liquid-Sugar Blends Have Industry-Wide Uses

Four new liquid sugars, special blends of various percentages of sucrose and dextrose, have been compounded for maximum utility in the various food branches.

Known as "Sucrodex", they are expected to find wide application in processing of beverages, baked goods, table and fountain syrups, preserves, candy, and canned goods. These sugar products combine the advantages of sucrose and dextrose to provide body in foods that carries the flavor with just the right amount of sweetness.

For example, an 80% sucrose-20% dextrose blend is said to be particularly useful to beverage producers, since it achieves the correct balance of sweetness and body.

Another blend supplied to bakers will improve crust color, enhance



115,000 GALLONS OF WATER Saved Daily!

The Problem: To obtain an adequate supply of water to meet the increased demand of expanded production involving continuous cooling to constant temperature.

The Obstacle: An overtaxed well that supplied water at close to capacity with no reserve.

The Solution: A revised cooling system which included a Deming End Suction Centrifugal Pump and a fresh water supply tank. Water is pumped rapidly through cooling lines and returned to the tank. A self-acting temperature flow valve opens a tap to permit fresh, cool water to supply the system as needed.

The Savings: The Deming Pump and the revised recirculating system reduced the amount of water required by 115,000 gallons per day. So successful is this system that three similar systems are now in operation by the same company.

What's YOUR pumping problem? The diversified line of *standardized* DEMING PUMPS gives you a wide selection for type, size and capacity. Write for details.

THE DEMING CO., 556 BROADWAY, SALEM, OHIO

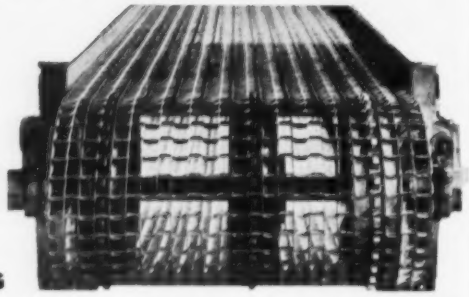
DEMING

"the Line that has Everything"
IN
PUMPS AND WATER SYSTEMS

For more data, circle this page number on card at back →

This Endless Belt Gives Endless Service

in
- Processing
- Packing
- Shipping



LA PORTE
FLEXIBLE STEEL
CONVEYOR BELTING

Whether your process is Freezing, Canning, Pickling, or Dehydrating, a La Porte Belt will carry your product through every operation, plus packaging, storing and shipping, safely, quickly and economically. Its strong steel mesh construction resists loading impacts, prevents creeping, weaving, and jumping, and permits the circulation of air, and liquids around products in process . . . also facilitates cleaning and sterilizing.

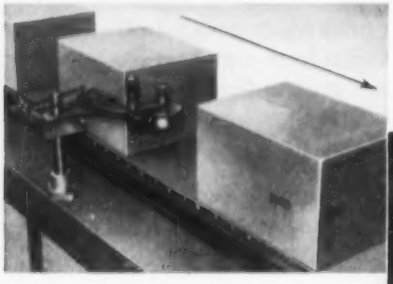
Available in ½" x 1"; also 1" x 1" in any length and practically any width.

LA PORTE

Ask your Mill Supplier or write for illustrated literature, prices.

MAT AND MFG. CO.
BOX 124 — La Porte, Indiana

Low-cost marking attachment pays for itself in weeks . . . saves thousands of $ every year



◀ ROLACODER twin-action markers . . . for imprinting codes and lot numbers on 2 or 4 sides of cases simultaneously . . . without requiring cases to be turned.

Friction-driven ROLACODER markers do your marking automatically . . . save cost of manual stencilling or stamping. Designed for easy do-it-yourself installation on existing conveyor lines, case-sealers, etc. They use quick-change rubber type or dies, hold 8-hour ink supply.

▲ ROLACODER single-side marker for accurate spot imprinting of brand names, varieties, code-dates, lot numbers on cases, cartons, fibre drums, bags, etc.

Gottscho

ADOLPH GOTTSCHO, INC.
Dept. G, Hillside 5, N. J.

In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Automatic CODING, MARKING, IMPRINTING MACHINES

Equipment & Supplies

fermentation, and provide a longer shelf-life through better moisture retention.—*Refined Syrups & Sugars, Inc., Yonkers, N. Y.*

Circle 177B on Reader Service Card

Potato-Starch Derivatives Now Offered in Quantity

Amylopectin and amylose, principal components of potato starch, are now available in commercial quantities in the U.S. Materials are imported from Holland.

The amylopectin, tradenamed Ramalin, has properties somewhat like amioca and is used as a suspending agent for foods. Applications for amylose (Superlose) are still largely experimental. However, having film-forming properties, its biggest single potential appears to be in packaging. —*Stein Hall & Co., 285 Madison Ave., New York City.*

Circle 178A on Reader Service Card

CHEMICALS

Many Applications Cited For Powdered Detergent

Excellent cleaning properties are reported for a new all-purpose powdered detergent.

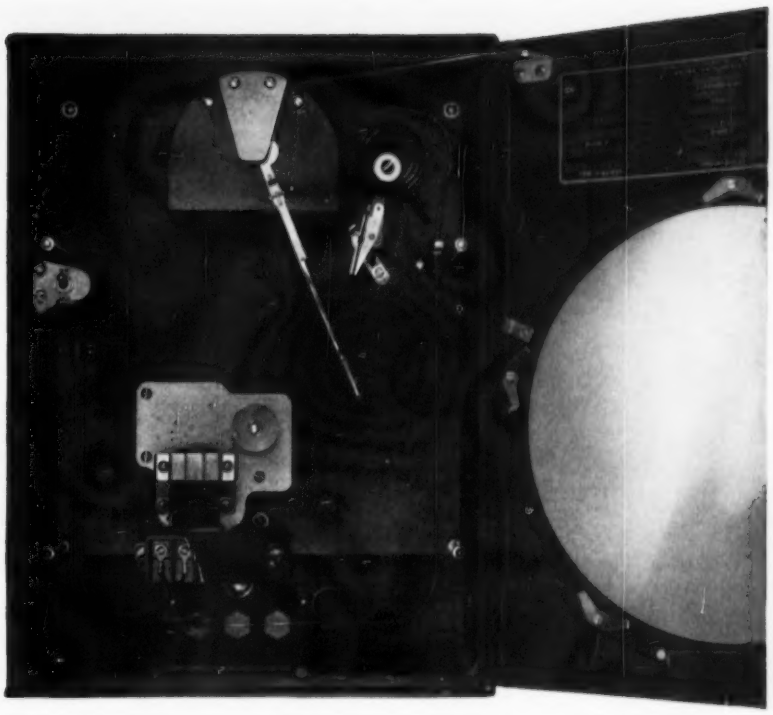
Containing no fillers, product (A-P-C) is buffered to maintain a maximum pH of 10.6, yet will not harm the hands. It is recommended for cleaning aluminum, durable painted surfaces, floors, equipment, and vehicles; also as a steam-cleaning composition and in hand-washing of utensils.

Detergent is used at ½-4 oz. per gal. of water, at temperatures ranging 70-140F. It is soluble in hard and soft waters, hot or cold. Product is available in 140-lb. kegs.—*Kelite Corp., 81 Industrial Rd., Berkeley Heights, N. J.*

Circle 178B on Reader Service Card

Chelating Agents Derived From Sugar Acids

Special mixtures of polyhydroxy-acid derivatives reportedly are powerful sequestering agents for various metallic ions, particularly in strongly alkaline solutions. (*turn page*)



Simplicity... you'll find it in Brown Pressure Gages and Thermometers

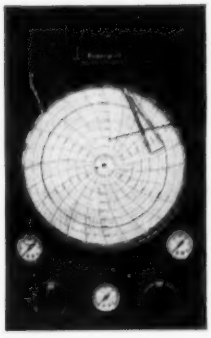
Clean, simple design—simplicity that minimizes operating or maintenance difficulties—sets Brown Pressure Gages and Thermometers apart. These rugged instruments use direct, simple linkages . . . very few parts. Basic components for both thermometers and pressure gages are interchangeable, and cases are identical.

The many narrow spans available, together with the large charts and scales, give you full use of the high accuracy of these instruments.

Brown Pressure Gages are available in many ranges, with a minimum of absolute zero and a maximum of 4,000 psi. Brown Thermometers are particularly suitable for the intermediate temperature range, extending from —125 to 1000 F.

Your nearby Honeywell sales engineer will gladly give you complete details on these instruments as they relate to your particular requirements. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.—in Canada, Toronto 17, Ontario.



Simplicity . . . Versatility, Too

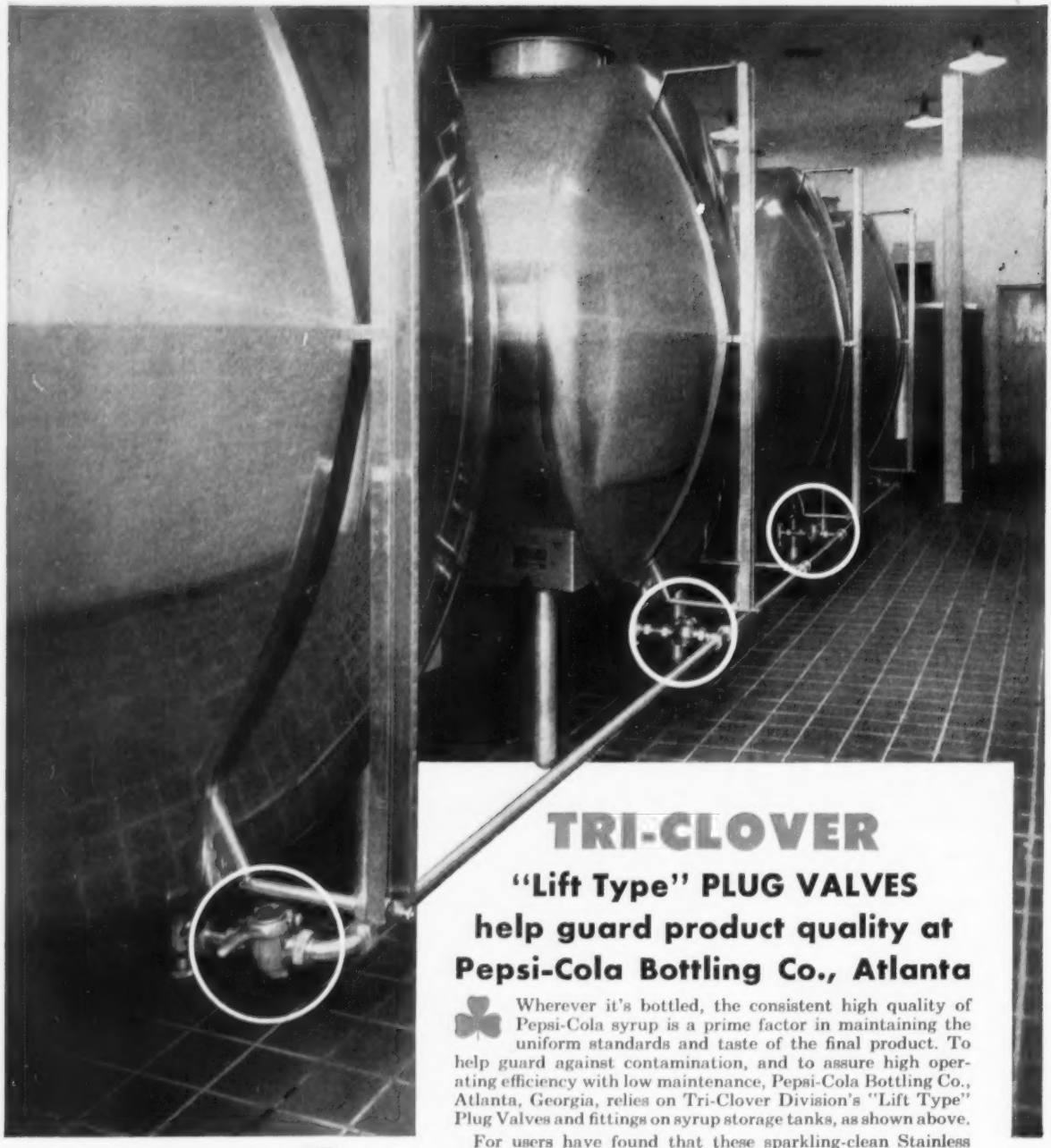
A wide variety of models, ranges and accessories are available for exact matching of Brown Pressure Gages and Thermometers to your specific applications.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

For more data, circle this page number on card at back →



TRI-CLOVER

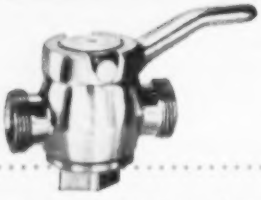
"Lift Type" PLUG VALVES help guard product quality at Pepsi-Cola Bottling Co., Atlanta

Wherever it's bottled, the consistent high quality of Pepsi-Cola syrup is a prime factor in maintaining the uniform standards and taste of the final product. To help guard against contamination, and to assure high operating efficiency with low maintenance, Pepsi-Cola Bottling Co., Atlanta, Georgia, relies on Tri-Clover Division's "Lift Type" Plug Valves and fittings on syrup storage tanks, as shown above.

For users have found that these sparkling-clean Stainless Steel Valves and Fittings stand guard against product contamination, provide quick, positive control of syrup or other liquid flow, are easily cleaned, and provide years of reliable service.

This is just one example of the way in which Tri-Clover Valves, Fittings, Pumps and Tubing are serving the bottling, brewing, dairy and food industries.

For full details, see your nearest Tri-Clover Distributor.



Secret of the smooth, easy action of Tri-Clover "Lift Type" Valves is the exclusive "cam action" of the handle and locking pin assembly, which provides a positive lifting and "cracking" action on the plug, by working against the spring steel plate below the valve body. In addition, constant holding pressure of the lower lock nut prevents leakage.

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

5-357

EXPORT DEPT., 8 So. Michigan Ave., Chicago 3, U.S.A. Cable: TRICLO • *In Canada:* 37 Hanna Ave., Toronto 3, Ontario

Products (Seqlene), which are non-toxic sodium salts of sugar acids, hold hard-water salts and other metallic contaminants in solution. Typical applications include bottle washing and caustic refining of fats.—*Pfanstiehl Laboratories, Inc., 104 Lakeview Ave., Waukegan, Ill.*

Circle 178C on Reader Service Card

BRIEFS

Lace-On Pipe Insulation offers easy installation, high efficiency from 100-1,200F. Product (Copr-Fibre) is a felted mineral reinforced with metal-mesh facing. Available thicknesses: 1-5½ in.; pipes sizes, 2-14 in.; K factor, 0.26 at 100F.—*Forty-Eight Insulations, Inc., Aurora, Ill.* (181A)

Rocker Spray Unit employs six nozzles strategically located to clean milk tank trucks up to 42 ft. long. For complete surface coverage, unit (Model No. 573) moves in a 20-deg. arc from the perpendicular, discharges 75 gpm. of cleaning solution at 90 psi.—*Oakite Products, Inc., 19 Rector St., New York City.* (181B)

New Shaft-Mounted Drives for heavy loads are available in 5:1 single-reduction ratio, and in double-reduction ratios of 14:1 or 25:1. Ratings of units (315J) range 2 hp. at 5 rpm. to 50 hp. at 359 rpm. Maximum torque at low-speed shaft is 31,000 lb.-in.—*Falk Corp., 3001 W. Canal St., Milwaukee.* (181C)

Self-Palletized Container for bulk and granular products eliminates need for separate pallets, streamlines loading and unloading. Expendable unit (Lift Pack) is internally braced and complete with lid. Capacities to 1 ton offer simplified storage, handling, and shipping.—*Titan Pallet Co., 342 Madison Ave., New York City.* (181D)

Heavy-Duty Filter Cloth, of new high-density polyethylene, has tensile-strength range to 100,000 psi., and is sterilizable at 250F. Material (Ploymax) is treated to minimize shrinkage at high temperature.—*National Filter Media Corp., 1717 Dixwell Ave., New Haven, Conn.* (181E)

Multi-Layer Tableting Press forms tablets with 2 or 3 distinctly separated layers of colored food or candy. Unit also produces combinations of

CLARK Says:

"Our Hayssen automatic Net Weight Scale is the *Only* unit we've found that completely fills our needs . . . after years of struggling with others."

• So many manufacturers have found this true, and switched to Hayssen.

There's more accuracy, efficiency, smooth product flow and economy on Hayssen automatic Net Weight Scales, with exclusive *Triple Vibrator* feed. Hayssen scales allow tolerances to 1/64 of an ounce and are available in 2, 3, 4, 5, or 6 scale units.

Let our experienced packaging engineers help you with your packaging problems. Contact us today!

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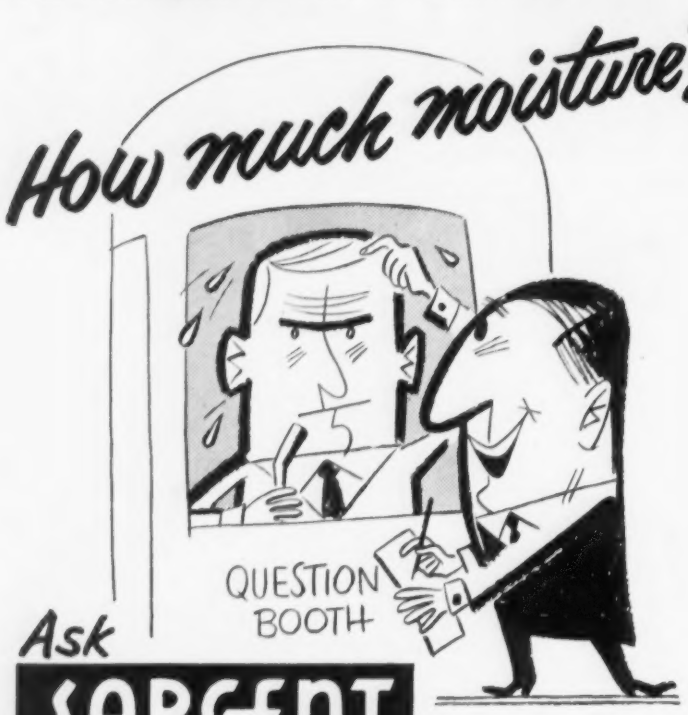
THE MULTI-MILLION DOLLAR QUESTION . . .



Ask SARGENT

Whether this all-important question is settled in Sargent's Laboratory or in your own, Sargent Dryers for food processing are guaranteed to deliver the product dried accurately, carefully, to the exact degree of moisture content desired.

For rice, cocoa, coffee, cranberries, nuts, fruits, cereals, berries, vegetables and other food products — even bird seed! — and wherever natural flavor, color, form and quality are a must, Sargent Dryers and Sargent Coolers are best for the job.

They are unusually rugged and dependable. Designed for easiest cleaning, for economical maintenance and operation — there are no hidden or hard-to-reach areas in Sargent Dryers! Built in any length, width, capacity. Economical of space, stainless steel throughout as required, performance-proven and guaranteed, every Sargent Dryer and Cooler is designed for your particular product, your process, your production.

Want more information? Just call your nearest representative or write us direct.

C. G. SARGENT'S SONS CORPORATION

Graniteville, SINCE 1852 Massachusetts

Drying and Cooling Machinery for all Process Industries

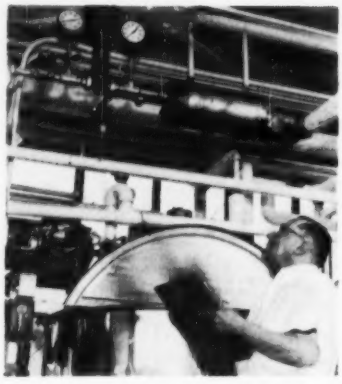
PHILADELPHIA 19 — F. E. Wesson, 519 Murdock Road
CINCINNATI 15 — A. L. Merrifield, 730 Brooks Avenue
CHARLOTTE, N.C. — W. S. Anderson, Carolina Specialty Co.
ATLANTA, GA. — J. R. Angel, Mortgage Guarantee Building
TORONTO 1, CAN. — Hugh Williams & Co., 27 Wellington St. East

Equipment & Supplies

several substances in a single tablet for vending machines, for example instant coffee, sugar, and powdered cream.—*F. J. Stokes Corp.*, 5500 *Tabor Rd., Philadelphia.* (181F)

Pressure-Sensitive Teflon Tape, used in conveying, heat-sealing, and as electrical insulation, rapidly attaches to metal, glass, or plastics. Special silicone adhesive gives high peel strength up to 500F. Product is available in 12-in. sheets and in rolls up to 2 in. wide, 0.006 and 0.013 in. thick.—*Chicago Gasket Co.*, 1271 *W. North Ave., Chicago.* (182A)

EQUIPMENT APPLICATIONS



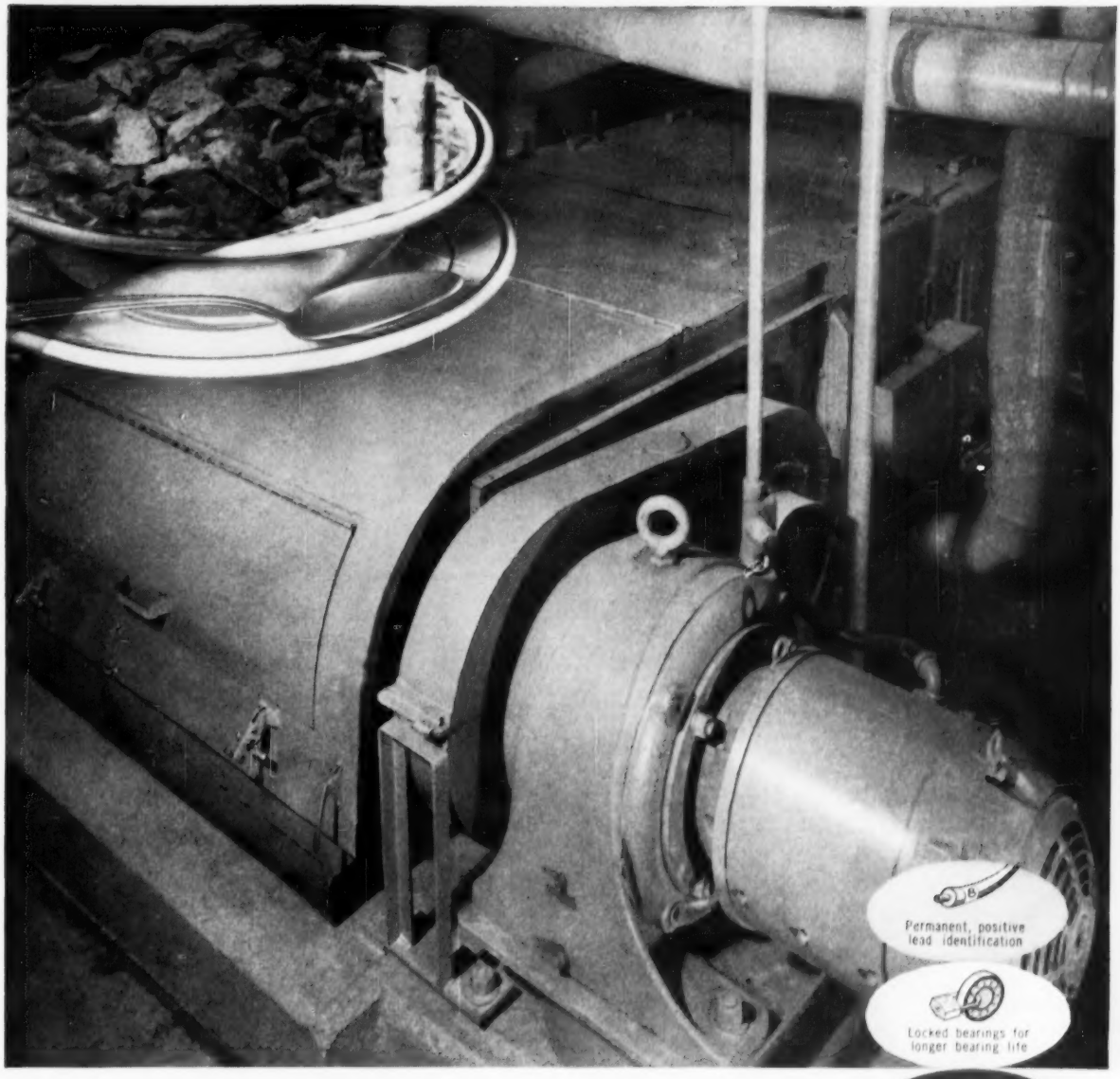
Automatic Control Permits 5-Sec. Starch Cooking

Continuous cooking of starch slurry has slashed processing time from 50 min. to 5 sec., at the Skokie, Ill. candy plant of Farley Mfg. Co.

In the company-patented process, cooking is sped by mixing slurry with live steam in a horizontal cylindrical pressure chamber (above kettle in photo), which replaced processing in steam-jacketed kettles. Furthermore, the automated system provides these four additional benefits:

1. Cuts steam consumption 85%.
2. Requires only one operator.
3. Produces a clear finished product.
4. Doubles shelf-life of candy through better gelatinization.

Complete automation is accomplished by use of temperature control, which keeps the slurry-steam



How to keep corn-flakes moving...

Louis Allis motors provide reliable drives, uninterrupted process flow

Modern food processing systems require dependable drives to keep production flowing smoothly. A minor motor breakdown often means costly waste, as well as loss of production.

That's why many segments of the food industry are turning to Louis Allis for help in powering food-handling machinery. Louis Allis engineers, expert in food systems installations, are available to advise you on correct drive applications. Their recommendations often can save you money on the initial installation, as well as eliminate a source of future problems.

What's more, all Louis Allis equipment is pleasingly styled to blend well into today's modern publicly-viewed food plants, where appearance is important.

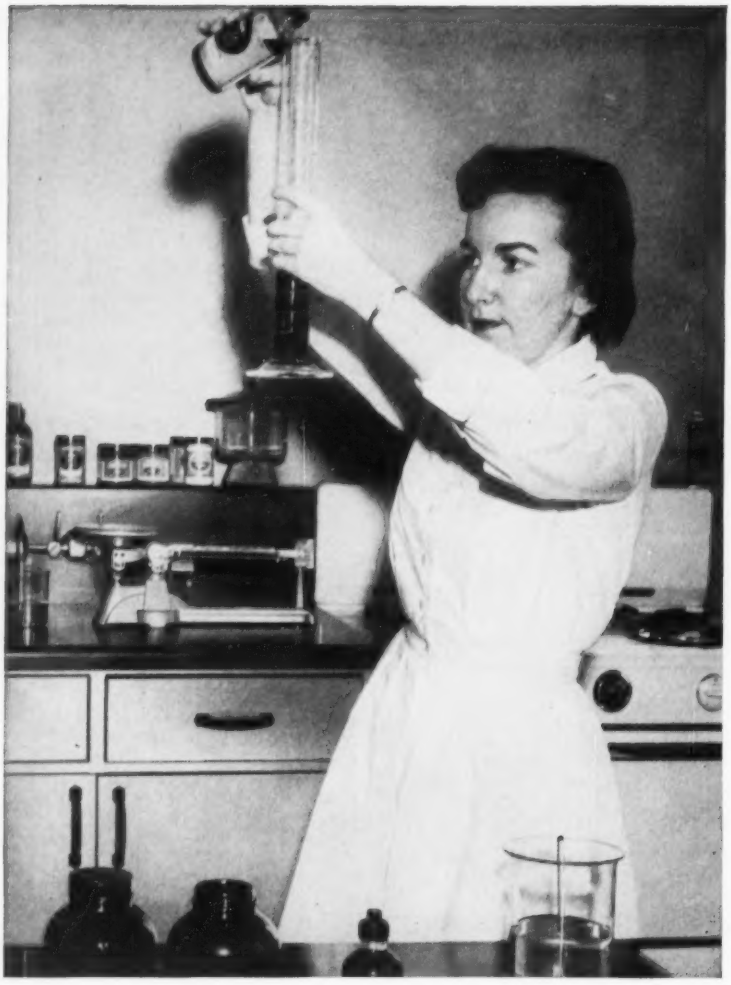
Why not ask for a list of food plants in your area using Louis Allis motors? See what *they* say. Contact your Louis Allis District Office, or the Louis Allis Co., 442 E. Stewart Street, Milwaukee 1, Wis.

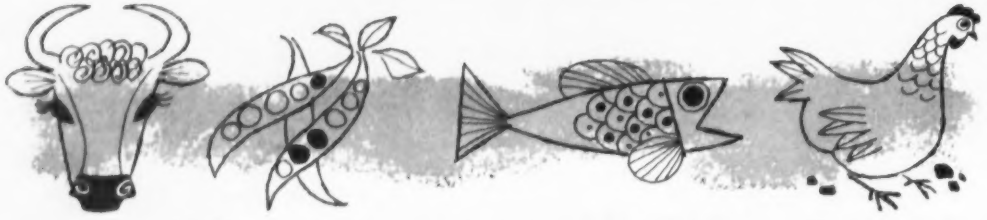
LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

For more data, circle this page number on card at back →

new ways to improve your product and profits





Animal, vegetable, fish or fowl—if your forte is food, Huron HVP (Hydrolyzed Vegetable Proteins) can help you enhance the quality and broaden the market for your products. This, of course, means extra sales and profits for you. In our modern, well-equipped Technical Service Laboratory, we will be happy to work with you to determine the proper use levels for your individual products.

The new booklet, *"Huron HVP," will give you a wealth of information on specific applications of HVP in all phases of food processing. For your free copy, write, wire or phone Huron Milling Division, Hercules Powder Company, Wilmington 99, Delaware.*

HVP HURON MILLING DIVISION

Virginia Cellulose Department HERCULES POWDER COMPANY *Wilmington 99, Delaware*

SALES OFFICES: 380 MADISON AVENUE, NEW YORK 17, N. Y. • 332 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILL. • 120 MONTGOMERY STREET, SAN FRANCISCO 4, CALIF.

mixture at proper temperature for thorough cooking.

In operation, batch ingredients are first mixed in a kettle at 150-180 F., then pumped to the foot-long pressure chamber. After being cooked at 80 psi. (278 F.), both steam and candy flow through a tail pipe to a receiving kettle. Escaping steam is conducted out of the building through an exhaust stack.

A 1-in. diaphragm valve (Flowrite, Powers Regulator Co., 3434 Oakton St., Skokie, Ill.) fitted on steam line regulates flow of steam in response to temperature changes in cooked slurry.

Circle 182B on Reader Service Card

Special Plastic Tents Offer Flexible Grain Storage

Coated nylon tents have upped storage and handling efficiency for General Mills, Inc., in its Montana grain operations.

Four such units, each of 30,000-bu. capacity, accommodate surplus wheat when elevators are full. Portable tents (Savage Mills, Inc., 495 Bushwick Ave., Brooklyn, New York) are Neoprene coated and all seams are cemented for waterproofness. They are available in capacities from 1,000-1,000,000 bu.

Circle 185A on Reader Service Card

Efficient Clarification Ups Flavor Quality, Output

Use of a centrifugal clarifier has boosted production of quality extracts and concentrates at Polak & Schwartz, Inc., Teterboro, N. J.

Hourly capacity of unit (Westfalia KG-2006, Centrico Inc., Englewood, N. J.) is 65-140 gal., depending upon product characteristics. Typical items processed include flavors such as cherry, raspberry, strawberry, peach, and pineapple.

Operating efficiency is attributed to unique construction of the clarifier bowl, which is divided into several chambers. Solids are removed in gradual stages, according to their size and specific gravity, as liquid progresses through these chambers. Clarified material never contacts the feed, which guards product purity. And foaming is eliminated because there is no incorporation of air.

Circle185B on Reader Service Card

Do you make one of these products?

☐ Baby Food ☐ Cheese Spread ☐ Chocolate, Liquid ☐ Chocolate Coatings ☐ Coffee, Liquid ☐ Cooked Cereal ☐ Cottage Cheese, Creamed ☐ Fish Paste ☐ Flavorings ☐ Food Cultures ☐ French Dressing ☐ Honey ☐ Ice Cream Mix ☐ Mayonnaise ☐ Meat Spread ☐ Milk Products ☐ Protein Foods ☐ Purees ☐ Salad Dressing ☐ Sauces ☐ Starch ☐ Yeast

Make it easier... make it better with a **TRI-HOMO DISPERSER-HOMOGENIZER**

The modern efficiency way to process viscous liquid, slurry or paste food products. Triple-action TRI-HOMO mills homogenize, emulsify and effect particle size reduction all in a single controlled operation. Designed for consistently positive duplication of any formula. Matched rotor-stator combination to suit your particular product. Contamination-proof . . . leakproof . . . jam-proof. Easy to clean. *Write for catalog.*

Sanitary pump-feed model #6 shown. Other models for laboratory, batch or continuous production available.

TRI-HOMO SALES CORP. 261-B FIFTH AVENUE, NEW YORK 16, N. Y.

CY BELT says

"I can help you cut production costs!"

Unnecessary manual handling of products can add unnecessary expense to the price of your product. Very frequently a Cyclone Metal Conveyor Belt can speed up processing time and eliminate superfluous personnel. Perhaps it has been a long time since you took a critical look at your materials processing system. Why not do that soon? One of our trained salesmen would be glad to help. Chances are he can show you exactly how a Cyclone Belt can help the profit side of your ledger. There is *no obligation.* Just fill in coupon.

CYCLONE FENCE DEPARTMENT
American Steel & Wire Division, United States Steel Corporation, Waukegan, Illinois
United States Steel Export Company, New York

USS CYCLONE METAL CONVEYOR BELTS
SPIRAL WOVEN
FLAT WIRE · FLEX-GRID

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Please have your trained representative call on us to discuss our production problems.
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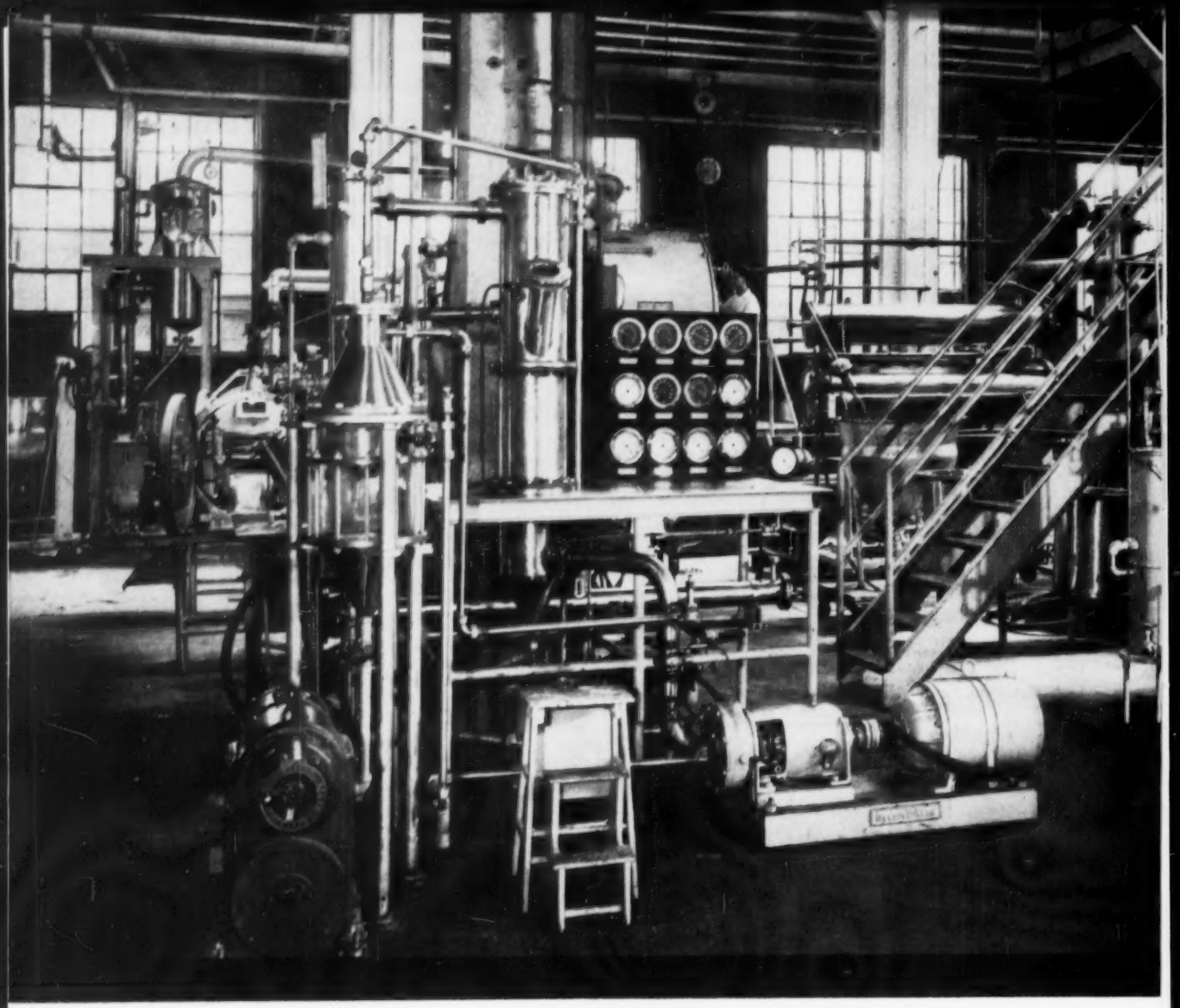
UNITED STATES STEEL



Buflovak puts the best equipped processing lab at your service

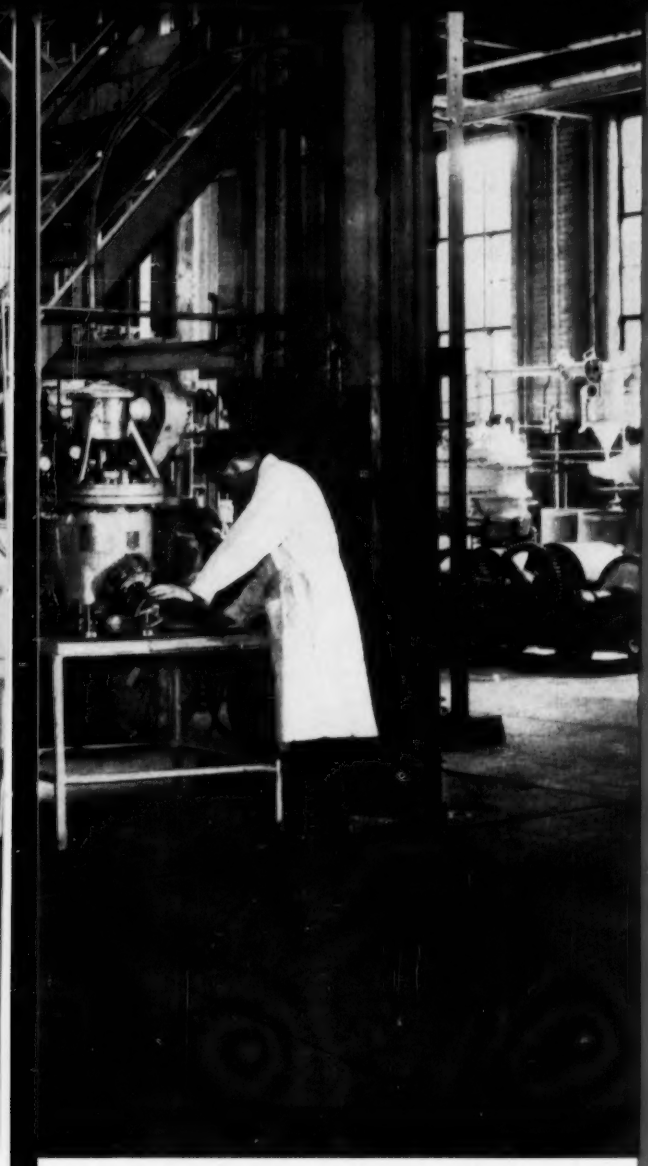
Buflovak laboratory has solved over 7000 processing problems. This thorough research, conducted by an experienced staff of skilled engineers, has lead to many new methods now in use in the chemical, food, pharmaceutical and allied fields.

Buflovak's research and development center is the world's most completely equipped processing laboratory for investigating drying, evaporation, extraction, impregnation, crystallization and other related processes.

Here you can obtain accurate performance data on your product . . . examine your process efficiency . . . explore by-product possibilities. Whether you test a few beakers of precious material or run tank car quantities on a round the clock production scale, you get proof positive on the operation.

Buflovak laboratory is a complete processing plant equipped with a variety of small experimental units and semi-plant size equipment. New models are continually installed, so that the testing apparatus is always the latest obtainable.

Constant research makes Buflovak designs the most modern in the field, the most dependable in operation. Because Buflovak builds a complete line of processing equip-

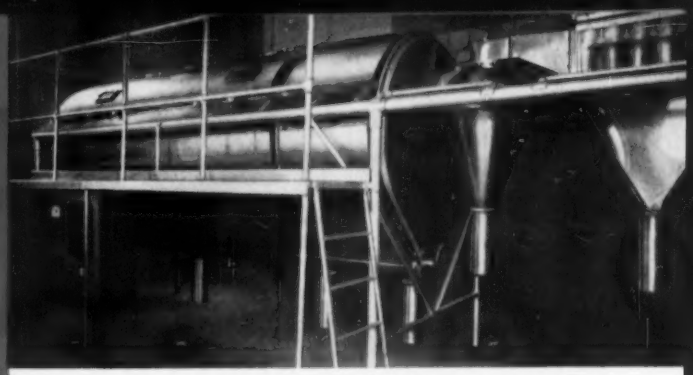


▲ **Testing evaporation.** This Forced Circulation Evaporator (above at left) is used to concentrate heavy liquids. Buflovak evaporators are designed to fulfill a particular application . . . to provide a virtually complete recovery of solids . . . to produce a finished product suited to market and process requirements.

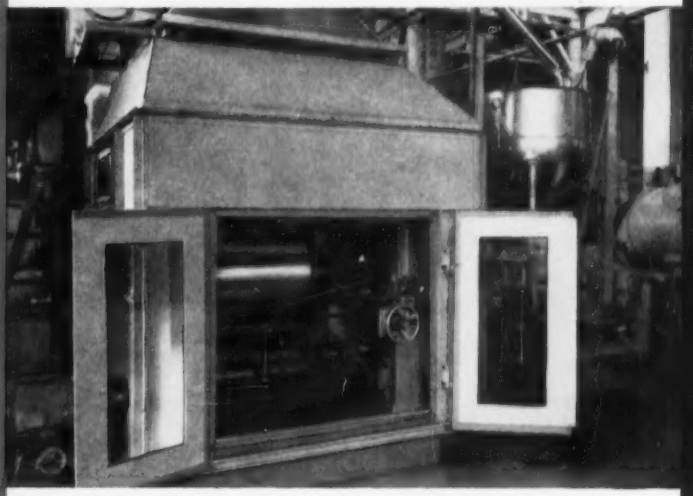
ment—such as evaporators, dryers, kettles, autoclaves and flakers—it can impartially recommend the units that sound research indicates the best.

Take advantage of Buflovak's 50 years experience. Your engineers are invited to consult our staff without obligation.

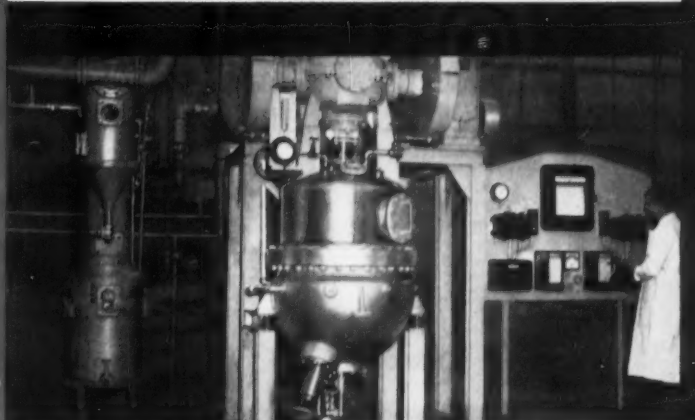
For details, write for Catalog 358.



When experimenting with high recovery of solids, this pilot plant Spray Dryer is often used. Instantaneous drying from liquid to dry product provides new product characteristics, opens up new markets for chemical, pharmaceutical and food manufacturers. Noted for its low initial cost, Buflovak Spray Dryers assure low maintenance costs.



How to handle dusty or toxic materials is another aspect of Buflovak research. Dyes, herbicides and other materials can cause serious dust and fire hazards, often release toxic solvents. Buflovak enclosed Double or Twin Drum Dryers have been found to offer complete safety against these dangers, and to permit the reclaiming of important solvents.



Concentrating, mixing, reacting and many other processes are checked in this 50-gallon Stainless Steel Processing Kettle. Tests can be run at atmosphere, under pressure or at full vacuum. It is equipped with a double motion agitator with separate variable speed drives for each agitator element.

BLAW-KNOX

BLAW-KNOX COMPANY

Buflovak Equipment Division

1631 Fillmore Avenue, Buffalo 11, N.Y.

See our exhibit in Booth 581—Chemical Show, New York—December 2 to 12.

Now! A completely new INGREDIENT FOR SOUP MIXES

SnowFlake Instant Milo Starch

8 *ways better for*
CANNED SOUPS AND CREAMED FOODS

1. Thickens instantly and completely.
2. Assures superlative full-bodied smoothness.
3. Completely pre-cooked under rigidly controlled conditions.
4. Disperses evenly in liquids and solutions.
5. Inherent viscosity control for easier reconstituting of dry mixes.
6. Pure, all-white, flavor-free cereal starch.
7. Fine particles of uniform size—flows freely.
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Ideal for use in soup mixes, SNOW FLAKE Instant Milo Starch is more flavor-free, faster-thickening. Because SNOW FLAKE requires less critical measurement of water in reconstituting dry mixes this amazing new starch gives you more leeway in formulation.

Note at left the many advantages offered by new SNOW FLAKE Starch. Write for detailed information. Ask also about technical assistance in adapting this versatile new ingredient to your requirements. Address:

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PLANT ENGINEERING

Transmission Belts

Technical data on transmission belts for speeds to 100,000 rpm. 6 p.—*Russell Mfg. Co., Middletown, Conn. (189A)*

Venturi Type Desuperheaters

Describes new line of desuperheaters with emphasis on lighter weight and flexibility in water inlet location. Bulletin Supp. 6D, 2 p.—*Dept. JA-11, Schutte & Koerting Co., Cornwells Heights, Pa. (189B)*

Fail-Safe Electric Brakes

Report includes photographs, drawings, diagrams, and complete explanation of operation, selection factors, torque characteristics and controls. T. R. WEB 6293, 36 p. —*Warner Electric Brake & Clutch Co., Beloit, Wis. (189C)*

Cost-Saving Metering

Contains metering information, including case histories. Describes various meters and registers, gives maintenance rules, installation suggestions, results of surveys in food and chemical processing. Bulletin NI-57, 12 p.—*Neptune Meter Company, New York City. (189D)*

Midget Thermocouple Gland

Describes gland which provides positive seal for pressures from .005 microns to 5,000 psi. and temperatures from −300+1,850 F. Bulletin MTG, 4 p.—*Conax Corp., Buffalo. (189E)*

Inert Gas System

Outlines new inert gas system and depicts typical installation. Bulletin I-457, 4 p.—*Gas Atmospheres, Inc., Cleveland. (189F)*

Filling Machine

Operating manual for Type 15MS heavy duty type filling machine. 21 p.—*Hope Machine Co., Philadelphia. (189G)*

Diaphragm Metering Pump

Reveals construction of diaphragm pump that can feed at up to 900 strokes per min. for precise ratio control. Also shown are some of the possible multiple feed arrangements. Bulletin 301, 4p.—*Hills-McCanna Co., Chicago. (189H)*

Transmission Products Line

Covers a variety of shaft collars, couplings, clutches, pillow blocks, take-ups, wheel hubs, gears, holdbacks, chains, and sprocket wheels. Many drawings and tables of dimensions aid the presentation, and technical information is given on the use of these products in elevating and conveying machinery. Catalog 914, 88p.—*Jeffrey Mfg. Co., Columbus, Ohio. (189I)*

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Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given of the bottom of each item) on the handy Reader Service postcard — back of book. Then sign at the bottom and mail.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

Variable Speed Drives

Uses simple sketches to explain action of drives that give all speeds from top to zero and reverse. Wide choice of controls are available. Bulletin 522, 8p.—*Graham Transmissions, Inc., Menomonee Falls, Wis. (189J)*

Normal Speed Motors

Explains advantages of advanced design features in a line of electric motors. Bulletin 194, 12p.—*Sterling Electric Motors, Cincinnati. (189K)*

Oil-Free Rotary Pump

Describes an oil-free, rotary vane pump for vacuum and pressure applications. 4 p.—*Dexter Folder Co., Pearl River, N. Y. (189L)*

Desuperheater

Outlines working principle of advanced thermodynamic design of new unit. Bulletin 1037, 4

Model SP-6

Models SN-7, 8 Panel

Models SL-8, SL-10, SL-12 Panel

Models MC-8, 10, 12

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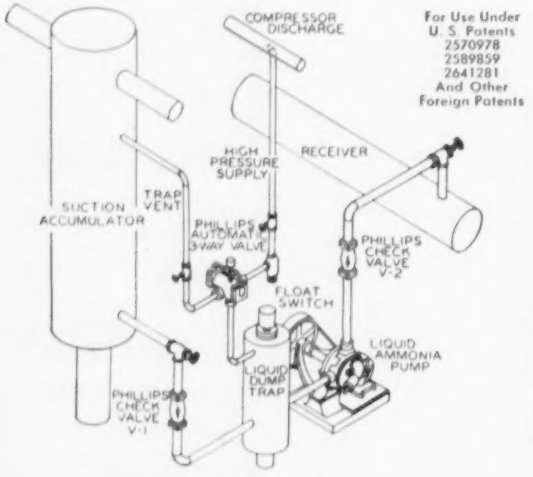
Ammonia "Slop-Over" Handled Automatically by PHILLIPS Liquid Return System

Protects Compressors, Saves Power, Makes Defrosting and Maintenance Simpler

Even in the best designed refrigeration systems, ammonia "slop-over" is a common occurrence. Two stage compression systems, booster systems and control ammonia compression systems subject to fast temperature and pressure changes are especially likely to have liquid in suction lines. This condition can seriously damage compressors which should handle dry gasses only.

Engineers at H. A. Phillips & Co. have devised a system that automatically returns "slop-over" directly to the receiver without regenerating and re-condensing the liquid. As shown in the drawing below, the Phillips Liquid Return System takes liquid ammonia which has collected in the accumulator, drains it through an outlet valve and check valve (V-1) into a liquid trap. Drainage occurs when the trap is at a low pressure. The trap is vented to the accumulator through a three-way valve and vent line. As the trap fills, a float switch is activated, energizing a three-way valve. This valve closes the vent line and connects the compressor discharge to the trap. Pressure builds up in the trap and closes check valve V-1. Pressure in the trap then reaches the same pressure as the receiver, opening check valve V-2 and allowing gravity to carry the liquid to the receiver. If gravity flow is not possible, a liquid ammonia pump is used. High pressure at both the pump inlet and outlet prevents flashing the liquid into gas. When the liquid trap is empty, the three-way valve is de-energized, closing the high pressure line to the trap. The trap is again vented to the accumulator, allowing liquid to drain once again into the trap.



Phillips Liquid Return System

This arrangement is highly efficient since only one pound of compression gas is required to move 25 pounds of liquid. There is practically no loss of refrigeration potential of the recovered liquid. The system also permits oil flushed into the accumulator to be easily drained.

A number of "packaged" variations of this system in capacities to 1000-tons are available to handle all arrangements of accumulator and receiver locations. For full details, write . . .

PHILLIPS

H. A. PHILLIPS & CO.
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p.—*Copes-Vulcan Div., Blaw-Knox Co., Edic, Pa. (189M)*

Air Conditioning

Explains and illustrates correct application of electronic controls and Uni-Flo distribution products. Bulletin F-8326, 4 p.—*Barber-Colman Co., Rockford, Ill. (190A)*

Finned Cooling Coils

Explains construction of sturdy fin cooling coils. Photos show applications in food plants. Bulletin 158A, 4p.—*Frick Co., Waynesboro, Va. (190B)*

Larger Dry Fluid Drive

Introduces dry fluid drive unit with horsepower ratings 50% over previous maximum. New unit is recommended for use with motors rated up to 75 hp. at 1750 rpm. Bulletins A64, 646A, 12p.—*Dodge Mfg. Corp., Mishawaka, Ind. (190C)*

Boiler Safety Controls

Covers basic safety controls for low pressure steam boilers. 24 p.—*McDonnell & Miller, Inc., Chicago. (190D)*

Linear Accelerator

Describes atom smasher for research in food preservation and for limited commercial processing. 8 p.—*Applied Radiation Corp., Walnut Creek, Calif. (190E)*

Roller Chains and Sprockets

Catalogs extensive line of roller chains and accessories. General technical information includes advantages of roller chains, applications, selection information for chains and accessories, installation and lubrication recommendations, and chain length calculations. Bulletin 757, 68p.—*Diamond Chain Co., Indianapolis. (190F)*

Non-Clog Ball-Transfer Unit

Informs on free-wheeling ball unit that can be mounted on standard tables for quick transfer jobs. Also has other applications. 2p.—*Metzgar Conveyer Co., Grand Rapids, Mich. (190G)*

Steam Jet Exhausters

Describes line of exhausters—air and gas pumps that operate on the jet principal, at moderately high vacuum, using live steam or air as the motive force. Includes application, construction, and operation information on various types and sizes of units plus laboratory applications. Capacity curves, ratios, and steam and air consumption tables, make it easy to determine the type and size needed. Bulletin 4E, 8p.—*Schutte & Koerting Co., Cornwells Heights, Pa. (190H)*

Small Precision Switches

Describes line of precision switches for all types of electrical controls. Form 84-161, 8 p.—*Micro Switch, Freeport, Ill. (190I)*

Air-Operated Valve Line

Has technical information on line of air-operated Saunders-type valves. Sizing data and a comprehensive list of flow coefficients aid in selecting of units. Valves incorporate close-coupled design and are available in a range of sizes with diaphragm and cylinder actuators. Bulletin HB-6, 8p.—*Conoflow Corp., Philadelphia. (190J)*

MAINTENANCE

Belt Fasteners, Rip Plates

Shows line of belt-joining devices along with necessary tools. Has step-by-step photos of installation procedure. Applications, and instructions for use are covered. Bulletin F-112B, 6p.—*Flexible Steel Lacing Co., Chicago. 190K)*

Construction & Maintenance

Deals with floor treatments, cleaners, waterproofing, coatings, paints, etc. BP 6018, 128 p.—*L. Sonneborn Sons, New York City. (190L)*

Tile Floor Maintenance

Comprehensive bulletin on maintenance of rubber tile floors. Form 1402, 4 p.—*Multi-Clean Products, Inc., St. Paul. (190M)*

Fast-Drying Concrete Finish

Bulletin and data sheet cover principles, properties, and applications of a protective finish for concrete floors. Available in several colors, the fast-drying coating is resistant to many food products, as listed in the data table. Guide No. 47, 6p.—*L. Sonneborn Sons, Inc., New York City. (190N)*

Exhaust Purifiers

Describes catalytic exhaust purifiers for fumes and odors from gasoline, LP-gas and diesel-powered equipment. 4 p.—*Oxy-Catalyst, Inc., Wayne, Pa. (190O)*

Ground Detector and Alarm

Describes ground detector and alarm for 3-phase power system. 4 p.—*Principle Research & Development Corp., Franklin Park, Ill. (190P)*

Insulation Protective Coating

Explains how all-mineral protective coating for low-temperature insulating materials provides a smooth, rock-hard surface for protection against damage, and im-

spice RESEARCH NEWS

Four-Year Study Pinpoints Antioxidant Values of Spices

Research conducted at the Hormel Institute (University of Minnesota) has established the antioxidant activity of 32 spices in several types of fat-containing foods.

A total of 78 samples of the spices were used in tests run on lard, baked pie crust, a simple oil-in-water emulsion, mayonnaise, French dressing and ground pork which was stored at both 23° and 5° F.

Highlights: Sage and rosemary were found to be outstanding antioxidants in lard, each extending stability several times. Soluble fractions of the spices were found in the main to have less antioxidant power in lard than the ground spices. Oregano, rosemary, thyme and sage lengthened storage life of pie crust appreciably. Cloves, tumeric, allspice, mace and rosemary proved excellent antioxidants in the oil-in-water emulsion, as were allspice, cloves, rosemary and sage in ground pork. In mayonnaise, oregano had the highest antioxidant index, followed by cloves, rosemary, sage and thyme.

— • —

FURTHER DETAILS . . . on this Antioxidant Research Project are available from the Information Bureau, American Spice Trade Association, 350 Fifth Avenue, New York 1, New York.

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Production records achieved under actual plant operating conditions proves the tremendous capacity of this mill. No machine of similar size or cost matches the production of the Jayhawk Mill..

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All Jayhawk mills are guaranteed to be free of any defective material or workmanship.

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No maintenance trouble with the Jayhawk Mill. The rugged heavy duty thrust bearings have ample strength to withstand severe service.

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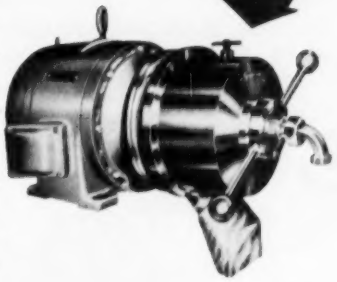
- ★ **SIMPLICITY** so that any operator can handle it.



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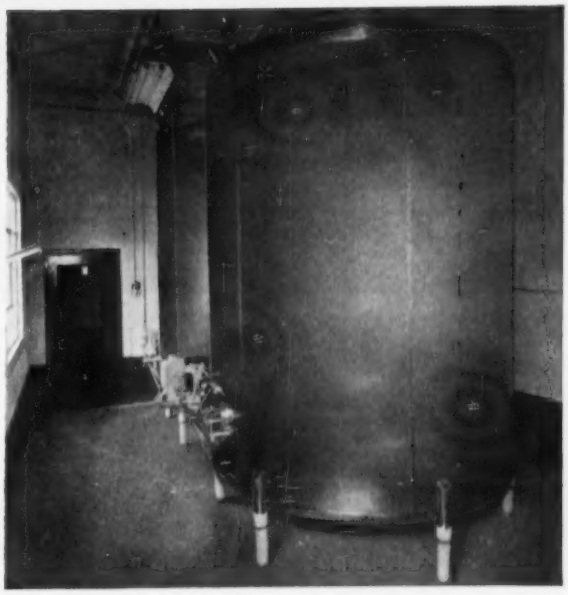

Model "C" closed-top tanks. Vertical sizes, 750-3500 gallons. Horizontal sizes, 500 to 5000 gallons.

Is this stainless steel tank big enough . . . or too big?

When you order tanks from Cherry-Burrell there's no such thing as a size limitation. Our *standard* stainless steel tanks range from 60 gallons through 5000 gallons capacities—larger and smaller tanks available on special order.

Just tell us what size you need, whether you want a single shell tank or one for heating and cooling, closed top or open top types. Your Cherry-Burrell Representative can tell you how we do it. Why not give him a call or write for literature?

Typical Cherry-Burrell Tank Uses

- Water Storage
- Ingredient Storage
- Syrup Making
- Liquid Sugar Making
- Liquid Sugar Storage
- Corn Syrup Storage
- Bulk Storage of Bottling Syrup

Model "O" open-top tanks; capacities 60 to 500 gallons.

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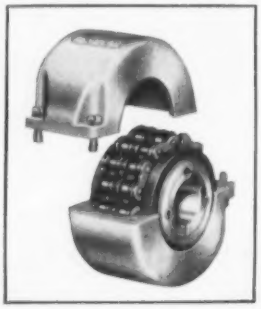

TAPER-LOCK CHAIN COUPLINGS

Accommodates common minor shaft misalignments. Provides strong, compact coupling. Available with covers, for appearance, safety, dirt protection and lubrication—which increases coupling life.

proves sanitation and appearance. Also stated to provide fire-proofing, and lower house-keeping and maintenance expense. 2p.—*Selby, Battersby & Co., Philadelphia. (190Q)*

Three Special Vinyl Coatings

A trio of bulletins discuss high-build vinyl that needs only two coats over primer to exceed thickness of 5 mils, decorative vinyl, and coating for masonry and plaster. Bulletins 33HB, 35, 88, 8p.—*Amercoat Corp., South Gate, Calif. (193A)*

Rust Prevention

Outlines applications and advantages of Sonneborn Rust Prevention System. 4 p.—*Sonneborn Sons, Inc., Building Products Div., New York City. (193B)*

Flexible Tubing

Chemically inert flexible tubing described. Bulletins 4 and 5, 2 p.—*Pennsylvania Fluorocarbon Co., Philadelphia (193C)*

Bending Pipe and Tubing

Supplies helpful hints to overcome fabricator's tube-bending problems. Bulletin PDB-187, 6p.—*Babcock & Wilcox Co., Beaver Falls, Pa. (193D)*

Monolithic Concrete Floors

Describes floor consisting of specially-formulated surface mixture of aggregate, with controlled water content, that fortifies and strengthens the base concrete. 4p.—*Kalman Floor Co., New York City. (193E)*

Corrosion-Proof Construction

Offers contracting facilities for corrosion-proof construction made available by materials manufacture. Contains application photos. Bulletin C1, 4p.—*Atlas Mineral Products Co., Mertztown, Pa. (193F)*

Valve Lubricating Manual

Lists right plug valve lubricants for 560 services. Picture-series shows proper method for inserting lubricant-stick in company's lubricated plug valves. Bulletin also contains concise guides for proper installation and operation of plug valves. 12p.—*Walworth Co., New York City. (193G)*

Ball Joints in Pipe Systems

Drawings and photos clearly illustrate applications of ball joints to give thermal expansion and contraction flexibility in piping systems. Bulletin 31, 6p.—*Barco Mfg. Co., Barrington, Ill. (193H)*

Foam Pipe Insulation

Lists prices of various sizes and styles of Styrofoam pipe insulation. Form PL 312B, 4p.—*Glo-Brite Products, Inc., Chicago. (193I)*

Oil Residue Remover

Describes Oakite Composition No. 124, specially designed to remove edible oil residues. Service Report B-6965, 2 p.—*Oakite Products, Inc., New York City. (193J)*

Titanium Uses

Describes titanium production, mechanical properties and typical uses. ADV-903—*Republic Steel, Cleveland. (193K)*

Stainless Steel

Technical digest of most popular stainless steels. Catalog, 32 p.—*Sharon Steel Corp., Sharon, Pa. (193L)*

PROCESSING

Brewery Filters

Describes polish and trap filters developed primarily for the brewery industry. Booklet PM-243, 4 p.—*Commercial Filters Corp., Melrose, Mass. (193M)*

Separating Equipment

Describes units for oil seeds and nuts, disk and knife hullers, shakers, tailings beaters, etc. Shows typical plant layout. Bulletin 0-4-A, 4 p.—*Bauer Bros. Co., Springfield, Ohio. (193N)*

Stainless Steel Filters

Describes and illustrates porous sintered stainless steel filters and provides characteristics, application data and specifications. Catalog 54-101, 12 p.—*The Cuno Engineering Corp., Meriden, Conn. (193O)*

Filter Cloth Catalog

Technical data on all types of filter cloth. Bulletin No. 10, 8 p.—*National Filter Media Corp., New Haven, Conn. (193P)*

Centrifugal Classifiers

Describes laboratory and plant size air machines for separating materials of low particle sizes. 4 p.—*Miag Northamerica, Inc., Minneapolis. (193Q)*

Ready-Mounted Kettle

Covers self-contained table-type tilting kettle mounted on stainless steel stand. 2 p.—*Groen Mfg. Co., Chicago. (193R)*

Aluminum Process Equipment

Three bulletins cover applications of aluminum in heat exchangers, tank and vessel hook-up,

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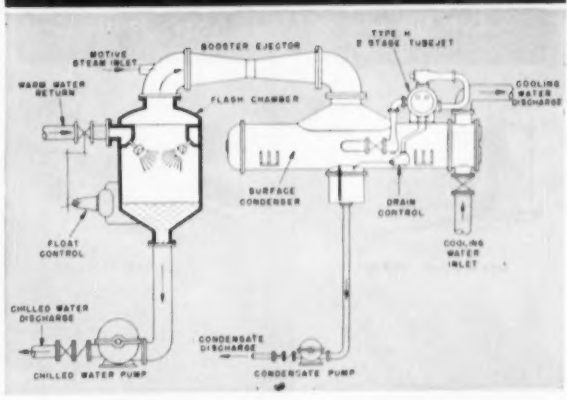

Above schematic diagram shows Wheeler Jet Vacuum Refrigeration Unit with surface condenser. Unit is easily adapted to low level jet or barometric jet condensers.

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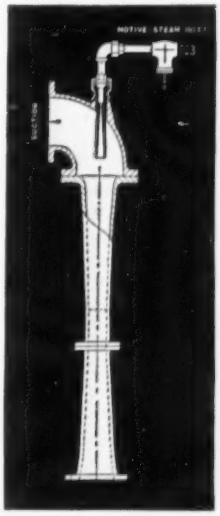
Maintenance costs are unusually low, too, because there are no moving parts, except for those in the chilled water pump. No noise or vibration, either, with Wheeler Steam Vacuum Refrigeration.

It's an ideal refrigeration system for any application requiring chilled water temperatures of from 35° to 65°F. Wheeler Jet Vacuum Refrigeration has proved itself time after time in the chemical, food and process industries.



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Wheeler "Tubejet"® Booster Ejectors withdraw vapors at high vacuum, and discharge them to a lower vacuum in the condenser. Air and non-condensable vapors are removed from the condenser by a two-stage Wheeler "Tubejet".

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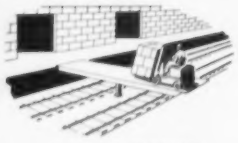
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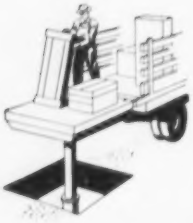
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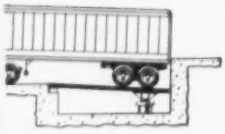
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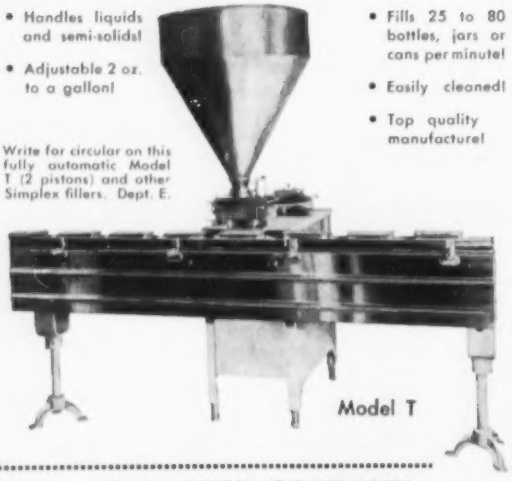
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and process piping. Description, cost advantages, application and design information, fabrication considerations, and an engineering service are all treated. Tables give engineering data. Bulletins C5, C8, C14, 24p.—*Reynolds Metals Co., Louisville, Ky. (193S)*

Continuous Strainers

Illustrates design, operation, and applications of Merco Rotary and Merco Bantam Strainers. Bulletin No. 2700, 4 p.—*Dorr-Oliver Inc., Stamford, Conn. (194A)*

Self-Cleaning Filters

Bulletins describe heavy-duty self-cleaning filters, and one designed specifically for the sugar industry. RSC Filter Bulletin and Sugar Bulletin, 2 p.—*Sparkler Manufacturing Co., Mundelein, Ill. (194B)*

MATERIALS HANDLING

Woven Wire Slings

Describes gripper slings with capacities up to 100,000 lb. 1 p.—*The Cambridge Wire Cloth Co., Cambridge, Md. (194C)*

Gravity Conveyor Uses

Ideas on use of gravity wheel conveyors supply answers to handling problems. Shows how conveyor strips can be combined or used in various combinations for many purposes. Specifications also included. Form FT-57, 2p.—*Rapids-Standard Co., Grand Rapids, Mich. (194D)*

Conveyor Belting

Describes line of conveyor belting for package, food and light industrial service. Catalog 124, 8 p.—*United States Rubber, New York City. (194E)*

Car Go Carts

Describes line of warehouse trucks for manual or drag-line operation. Bulletin 57-MF, 4 p.—*Nutting Truck & Caster Co., Faribault, Minn. (194F)*

Weighing Bulk Material

Neat bulletin compares batch-in, batch-out, and continuous weighing processes, and explains how a completely automatic weighing system can be assembled by building-block techniques, using unitized weighing components. Catalog 12, 20p.—*Weighing and Control Components, Inc., Hatboro, Pa. (194G)*

Pallet Transporter

Gives specifications and drawings of low lift walkie-type industrial truck. Bulletin 1008-W, 4 p.—*Automatic Transportation Co., Chicago. (194H)*

Warehouse Trucks

Specifications for warehouse trucks, dollies, jacks, skids, etc. Jr. Catalog 58G, 12 p.—*Nutting Truck & Caster Company, Faribault, Minn. (194I)*

Conveying System

Illustrates and describes engineered gravity roller conveying systems, 4 p.—*The Alvey-Ferguson Co., Cincinnati. (194J)*

Multi-Purpose Dumpers

Presents specifications, photos, and dimensional drawings of CESCO line of Skip Hoist Dumpers. 8 p.—*Essex Conveyors, Inc., Nutley, N. J. (194K)*

Walkie Type Truck Control

Details facts on operation of walkie control that is available as standard equipment on lift units. Unit offers both dynamic braking and controlled plugging. Circular 34-H, 4p.—*Lewis-Shepard Products, Inc., Watertown, Mass. (194L)*

INSTRUMENTS

Accessories and Supplies

Specifications, part numbers and prices for more than 250 instrument parts and supplies. Catalog 500, 60 p.—*The Foxboro Co., Foxboro, Mass. (194M)*

Ring Balance Meter Units

Bulletin uses arrow and caption treatment to explain features of line of recorders, indicators, and controllers. Color presentation has engineering details on the ring balance units. Applications are listed. Bulletin MSP-141, 6p.—*Hagan Chemicals & Controls, Inc., Pittsburgh, Pa. (194N)*

Control Refractometer

Describes unit employed with Brown ElectroniK instrument for measuring and controlling refractive index of liquid with great accuracy. Data Sheet No. 10.16-21, 2 p.—*Bausch & Lomb Optical Co., Rochester. (194O)*

Specific Gravity Control

Differential converter transmitter adaptable to continuous measurement and control of specific gravity of liquids in open vessels. IDS 10.14-8, 4 p.—*Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia. (194P)*

Redoubled Research

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Finer Food Colors

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FOOD COLORS

Allied Chemical

Changes in Certified Food Color Regulations are both a challenge and an opportunity.

As the leading producer, National Aniline has quickened the pace and expanded the scope of its research on new and better colors. We are cooperating constructively with every well-intentioned effort to provide even finer food colors into the future.

Meanwhile, our Technical Service Laboratories have lent prompt, practical help on necessary re-matches. New color formulations have been worked out to put even more eye-appeal into many processed foods.

We welcome the opportunity to work with you on current color problems and to plan ahead for even finer color in your new products.

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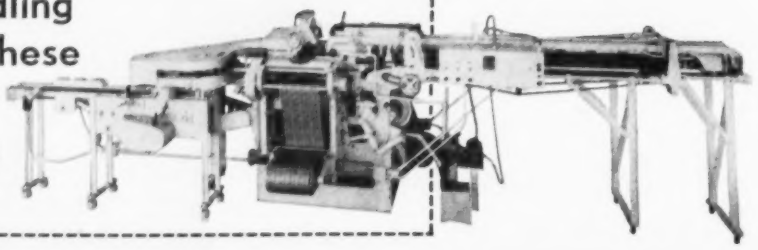
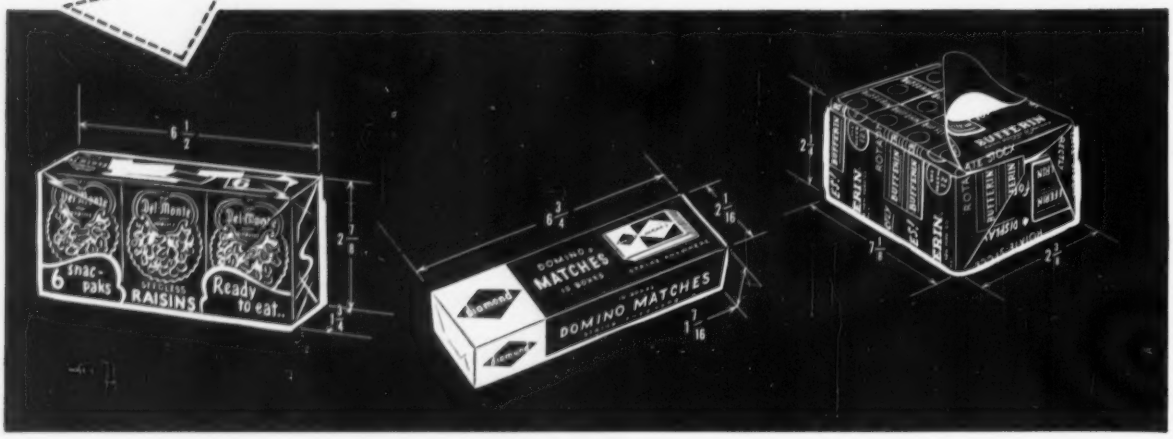
The Battle Creek Packaging Machine Model 48

has handled bundling problems within these ranges at speeds up to 60 bundles per minute





to produce packages like these

480 Individual Raisin Packages Group Wrapped Per Minute by Battle Creek's "Continuous Flow" Process.

Strike Anywhere Matches Attractively Group Wrapped for Impulse Sales.

Corrugated Cartons eliminated and Substantial Savings Effected by Bundle Wrapping 12 Packages of Drugs.

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Model 48 — This specialized machine is 'tailored' to your small package group wrapping problems. Where automation is the objective; the smooth, vibrationless *"Continuous Flow"* process can be easily adapted. Typical users who buy the Model 48 bundling machine include manufacturers of drugs, matches, food processors . . . those whose production demands fast-trouble-free group wrapping at lower costs per package. In one case involving the wrapping of 1½ oz. raisin packages, two alternating accumulating devices each delivered 40 units of six (240 individual items) per minute to the Model 48 for wrapping at a speed of 80 groups (480 single packages) per minute. Other applications are equally dramatic, and the savings, equally valid. At one end of the scale the Model 48 handles maximum lengths of 12", widths of 7½" and heights of 4½." At the other end — minimum lengths of 6¼", widths of 2" and heights of 2" utilizing kraft, book, sulphite papers or others requiring glue for sealing purposes. Conversion from one size to another is quick, easy . . . with changeover time averaging about 30 minutes.

Call on Battle Creek Packaging Machines today, for complete service on your bundling problems.

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packaging machines, inc.

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See us at The Packaging and Materials Exposition, March 25-28, 1958, Atlantic City.

PACKAGING

New Top Sheeter

Describes completely automatic machine that applies and crimps foil tops on rectangular packages. 4 p.—*Kaiser Aluminum & Chemical Sales, Chicago. (197A)*

Heat Sealing Equipment

New catalog shows tables for prepackaging food items. 12 p.—*J. B. Dove & Sons, Inc., Philadelphia. (197B)*

Label Gluer

Information about time-saving production gluer. Bulletins M-1 and F-1, 2 p.—*King Sales and Engineering Company, San Francisco. (197C)*

Marking Equipment

Addressing and marking labels, tags, cartons with small hand stencil duplicator, 4 p.—*Weber Marking Systems, Mount Prospect, Ill. (197D)*

Vibrating Packers

Describes packers for boxes, bags, drums, etc. Bulletin 63, 4 p.—*Ajax Flexible Coupling Co., Westfield, N. Y. (197E)*

Teflon Adhesives

Full line of Teflon tape and sheet that will adhere to a variety of surfaces. Bulletin A-3D, 2 p.—*Chicago Gasket Co., Chicago. (197F)*

QUALITY CONTROL

Laboratory Service Fixtures

Catalogs line of specialized, heavy-duty laboratory fixtures for gas, air, vacuum, and tap and distilled water. Remote control and emergency shut-off valves, corrosion resistant fittings, and electric and manual controls are included. Catalog PF-57, 8p.—*Laboratory Furniture Co., Inc., Mineola, L. I., N. Y. (197G)*

Silicone Glass Coating

Announces new silicone concentrate that forms protective coatings on lab glassware. Form 568A, 6p.—*Burrell Corp., Pittsburgh. (197H)*

Ready-to-Use Adsorbents

Announces complete line of adsorbents for gas and vapor-phase chromatography. Bulletin 835, 4 p.—*Burrell Corp., Pittsburgh. (197I)*

Photomicrographic Camera

Describes universal photomicrographic camera for advanced and research photomicrography and photomacrography. SB1300, 12 p.—*American Optical Co., Buffalo. (197J)*

Polyethylene Labware

Describes and prices lab equipment line available in inert lightweight polyethylene. Included are beakers, aspirator bottles, tubing, and vials, among others. Bulletin FS-268, 8p.—*Fisher Scientific Co., Pittsburgh. (197K)*

Spray Drying Laboratory

Describes facilities of pilot laboratory designed to test out equipment and procedures for spray-drying specific products. 22p.—*Bowen Engineering, Inc., North Branch, N. J. (197L)*

High-Force Lab Centrifuge

Gives details on 51,000-times-gravity laboratory centrifuge. Insulated, core-ventilated rotors make it possible to operate up to speeds of 20,000 rpm. in air without rotor over-heating. Bulletin SBK1, 4p.—*Beckman, Instruments, Inc. Palo Alto, Calif. (197M)*

Ultracentrifugation

Summary of various rotors, cells and accessories available for analytical ultracentrifugation. Form SBE-20, 8 p.—*Spinco Div., Beckman Instruments, Inc., Palo Alto. Calif. (197N)*

MANAGEMENT

Automation System

Complete guide to new Univac II Data Automation System designed for both computer specialist and layman. 79 p. —*Remington Rand Univac, New York City. (197O)*

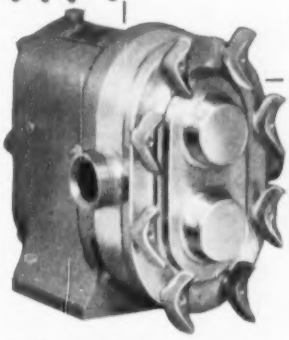
Transistor Converter

Describes analog-to-digital converter which is virtually maintenance free. 4 p.—*Beckman Instruments, Inc., Anaheim, Calif. (197P)*

Import Requirement List

Handy, quick-reference guide to import requirements of 168 foreign nations. Useful for determining specific consular documents, charges, and exact phraseology required for shipments to virtually any spot in the world. 6p.—*AEI-Air Express International, New York City. (197Q)*

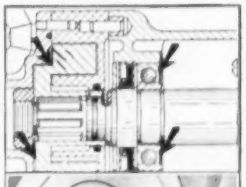
Get Longer Service at Lowest Maintenance... in Your Sanitary Pumping...with



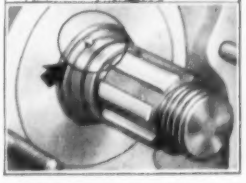
WAUKESHA P.D.* SANITARY PUMPS

Both metallurgically and mechanically, Waukesha P.D. Sanitary Pumps are designed specifically to meet the rigid demands of Sanitary regulations in pumping food and dairy products under virtually all conditions of head pressures and temperatures. The Waukesha Metals used are the result of over a quarter century of pioneering completely sanitary, easily cleaned sanitary pumps. And, mechanically, there are at least *eighteen* reasons for the longer service and lowest maintenance already proved in the food, beverage and dairy industries.

These "reasons" include such important factors as positive sealing with Twin O-Rings, better load-balance between shafts and heavy duty bearings, larger, stronger shafts, more and huskier splines — for greater rigidity, less wear — and newly designed twin blade impellers for better distribution of the load factor at all speeds and pressures. There are many more new features you'll want to know about.



This drawing shows the close position between the heavy duty ball bearings and the corrosion-resistant impellers — for reduced shaft-slap and wear.



Larger diameter shafts, more and larger splines, plus a new stainless steel shaft seal with positioning pin, assure greater rigidity to impellers and longer service.

*Positive Displacement

This new WAUKESHA 1957 Catalog gives you the whole story. Write for your copy, telling us what product you handle . . . Just a postcard will do.

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for industrial and "built-in" needs

Overwhelmingly preferred because of their all-metal ruggedness, stability and long life. In heavy duty types, straight and angle forms, 6″ and 5″ dia heads – industrial types, angle form, 3″ and 2″ heads; stainless steel stems, lengths from 2½″ to 24″. Ranges low as – 100 F to high as 1000 F; accuracy 1% of range.

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Available with mercury, liquid, gas filled, or vapor pressure actuations in 5″, 6″ and 8″ dial sizes – for wall or flush mounting. Models to indicate as low as – 325 F or as high as 1000 F. Available with adjustable electrical contact and index pointer for signal or alarm needs.

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Resistor bulb permits remote temperature readings – and by use of several bulbs, several different remote temperature measurements can be made using a selector switch. Accuracy 1% of full scale. Range low as – 100 to high as 500 F.

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Plastic Pipe Data Book

Has tables of pipe sizes available, specific applications, physical properties, temperature factors for various working pressures, supports, and thermal expansion. Flow charts, installation instructions, pipe characteristics, and fields of application also are included. Bulletin A557, 12p.—*Alpha Plastics, Inc., Livingston, N. J. (198A)*

Fire Safety Code

Reviews various services performed by a standpipe and inside hose system, including instructions for maintenance and periodic inspection. 8 p.—*Fire Equipment Mfrs. Assn., Pittsburgh. (198B)*

Data Processing

Illustrates use of automatic writing machines and other tape-operated units. 24 p.—*Friden Calculating Mch. Co., Rochester. (198C)*

Type 430 Stainless Steel

Colorful catalog gives detailed information on nickel-free straight chromium stainless grade. Describes physical properties and analysis, corrosion resistance, surface characteristics, fabrication, application, maintenance and cleanability, and availability of sheet and strip. 28p.—*Washington Steel Corp., Washington, Pa. (198D)*

Food Plant Lighting Guide

Catalogs lighting equipment that shows up correct color appearance of foods. This standardized lighting is stated to aid color evaluation. Bulletin 271, 2p.—*MacBeth Daylighting Corp., Newburgh, N. Y. (198E)*

Facts About Atlanta

Factors responsible for rapid development of Atlanta and the South. 42 p.—*Industrial Bureau of Atlanta Chamber of Commerce, Atlanta. (198F)*

Infrared Warning System

Describes photoelectric system installed indoors or out to protect against intrusion. Bulletin PA 579, 2 p.—*Photoswitch Div., Electronics Corp. of America, Cambridge, Mass. (198G)*

Service Station Listing

Lists motor and generator service stations throughout U. S. and Canada. 4 p.—*Marathon Electric Mfg. Corp., Wausau, Wis. (198H)*

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To improve product quality and lower spraying costs, Spraying Systems offers the advantages of advanced design and better performance. Typical applications include mixing, washing, cooling and spray drying. We also offer spray nozzles to meet unusual conditions such as high abrasion or extremely fine atomization.

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ADVANCED SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE

Disposable container with polyethylene coating

Polyethylene-coated "Sealkan" is a new product of Sealright Co., Inc.

saves money, space, handling time

Frozen eggs were originally packaged in metal cans and required 8 to 24 hours of thawing before they could be used. Now, a disposable fibre container with a protective polyethylene coating makes pre-thawing unnecessary. The eggs are frozen right in the polyethylene coated container. There is no danger of having paper fibres embedded in the product. When ready for use, the container is slit and peeled from the frozen eggs in seconds.

Repeated savings from this improved packaging design are substantial and customer acceptance is overwhelming. It brought a welcome end to the storage, disposability, and return problems of the earlier package.

Improving package efficiency is a sure way to fight the profit squeeze. A protective coating of BAKELITE Brand Polyethylene can equip many packaging materials for better service in handling liquids and solids in bulk and small quantities. For more information, write Dept. AO-63.

It pays to package in

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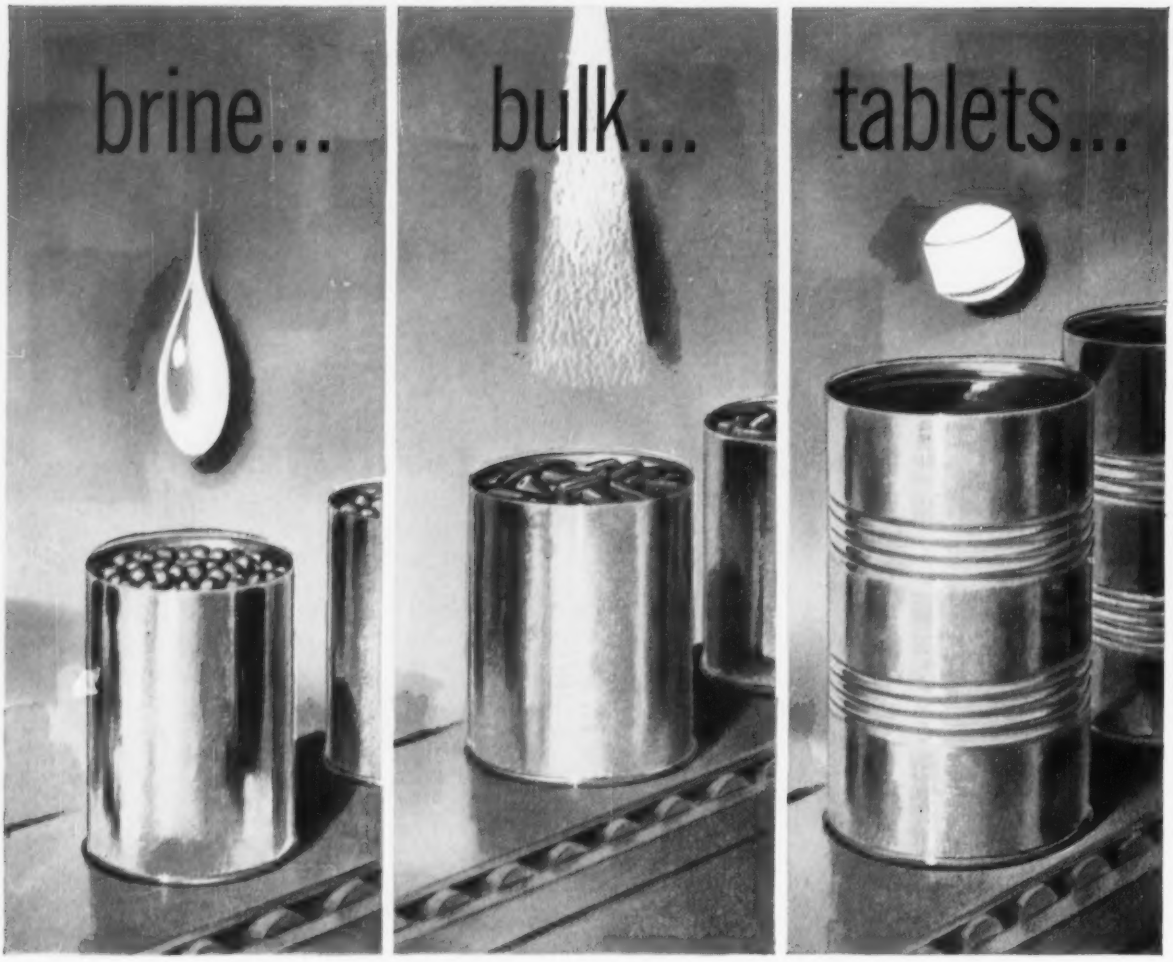

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Morton now offers you a single grade of high purity salt for all forms of dispensing. Morton '999' Salt is ideal for bulk use and brine because it is a cube type salt that won't break up in shipment and will dissolve uniformly. '999' also has a practically constant weight per volume and is easily and accurately dispensed by machine.

Morton '999' also comes in 10-grain to 400-grain tablets. (Trade name: Scienco Salt Tablets.)

No matter in which form you use Morton '999', you protect flavor. For '999' is a low cost, high purity salt, free from bitter calcium and magnesium compounds that can distort food flavor. Morton '999' is always 99.9% clean, pure sodium chloride, exceptionally low in the objectionable trace metals, copper and iron.

For more information about Morton '999' Salt and for ways in which you can dispense it most effectively, write:

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INDUSTRIAL DIVISION
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Chicago 3, Illinois

F. J. Tompkins, Chief Design Engineer (right), Bernard Anik, Mechanical Engineer (left rear), Singmaster & Breyer, N. Y. C. Foreground, Michael De Piano, Cooper Alloy Corp.

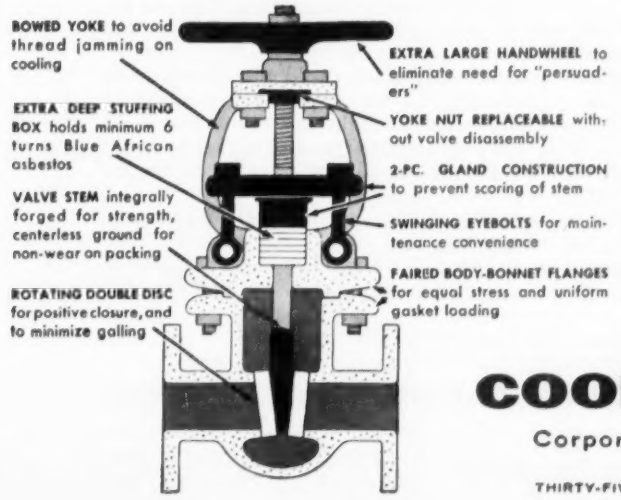
TOMPKINS and ANIK of SINGMASTER & BREYER

tell why they build Cooper Alloy stainless valves into their basic plant designs

Q. Gentlemen, precisely why do you buy Cooper Alloy valves?

FJT—With me, dependability is the main reason. My major concern is overall plant design, and frankly I don't have time to worry about every equipment detail. As specialists in designing and building "first-of-its-kind" processing plants, we need valves we can count on, and can "build in" as part of our original design. Cooper Alloy valves, we've found, fill that bill.

BA—From my point of view as a mechanical engineer, it's the Cooper Alloy valve *design* that appeals to *me*. It has extra features, like the extra-large handwheel, unique square compression of packing, bowed yoke, integrally forged stem, and others, all of which make for less maintenance and longer, more economical valve life.


BOWED YOKE to avoid thread jamming on cooling
EXTRA DEEP STUFFING BOX holds minimum 6 turns Blue African asbestos
VALVE STEM integrally forged for strength, centerless ground for non-wear on packing
ROTATING DOUBLE DISC for positive closure, and to minimize galling
EXTRA LARGE HANDWHEEL to eliminate need for "persuaders"
YOKE NUT REPLACEABLE without valve disassembly
2-PC. GLAND CONSTRUCTION to prevent scoring of stem
SWINGING EYEBOLTS for maintenance convenience
PAIRED BODY-BONNET FLANGES for equal stress and uniform gasket loading

A VALVE DESIGNED FOR STAINLESS!

The Cooper Alloy valve is not an adaptation of earlier brass and iron patterns. Cooper Alloy, with over 35 years of experience in handling stainless steel, created a valve *designed to be cast in stainless!* **Check the Special Design Features shown at left.**

As the little CA man below is saying: *"You can tell a Cooper Alloy Valve as far as you can see it!"* Write today for *your* copy of our folder "Design Factors In Stainless Steel Valves." The Cooper Alloy distributor near you will be glad to show you the complete line of Cooper Alloy valves *and fittings*, and their advantages. He can serve you promptly from local stocks.

COOPER ALLOY

Corporation • Hillside, New Jersey

VALVE & FITTING DIVISION

THIRTY-FIVE YEARS OF STAINLESS STEEL PIONEERING

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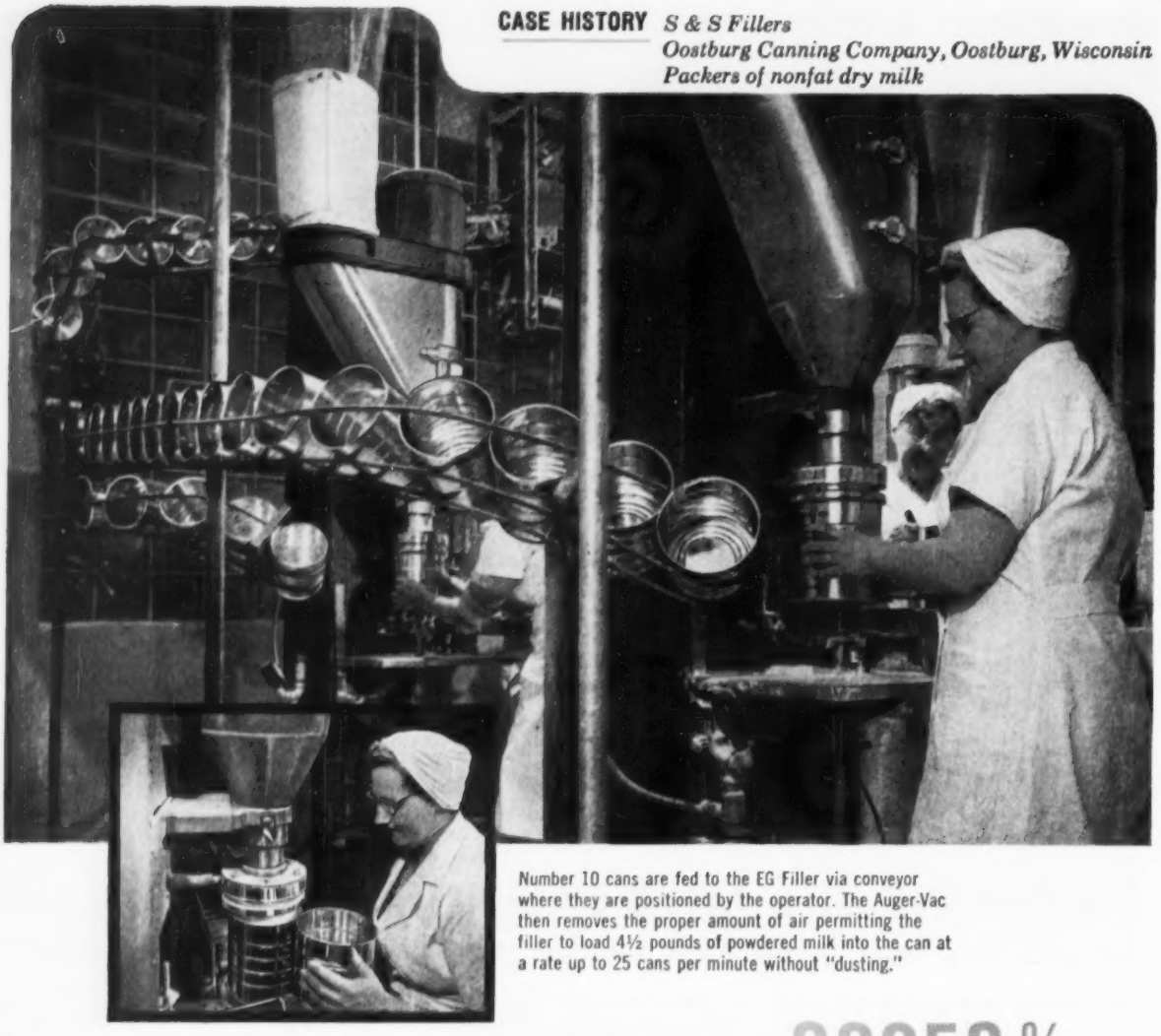
CASE HISTORY *S & S Fillers*
Oostburg Canning Company, Oostburg, Wisconsin
Packers of nonfat dry milk



Number 10 cans are fed to the EG Filler via conveyor where they are positioned by the operator. The Auger-Vac then removes the proper amount of air permitting the filler to load 4½ pounds of powdered milk into the can at a rate up to 25 cans per minute without "dusting."

Powdered milk filling loss less than .00058%

"Of the more than 200,000 pounds of powdered milk we handle each day, we lose only 110 to 115 pounds—or .00058%—due to dusting at the loading hoppers and filling stations. This amount would be much larger if we did not have Stokes & Smith Fillers with Auger-Vac attachment," reports Mr. Ellsworth Van Driest, secretary-treasurer of the Oostburg Canning Company.

"Before buying our fillers, we inspected other powdered milk operations to determine which machines were most efficient. We found that Stokes & Smith equipment led the field by a wide margin. In addition to three S & S G1 Fillers, we also purchased two S & S EG Fillers to permit quick easy conversion from packaging in 4½ pound, No. 10 cans to bagging cartons when the latter package is required.

"We have found our fillers to be dependable, rugged, well-designed and versatile. After two years of constant use, they are never down longer than one hour at a time. This ease of servicing plus versatility helps us maintain our 'full status' with U. S. Dept. of Agriculture packaging requirements."

For complete information on the versatile EG Filler, write to:

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FOOD MACHINERY AND CHEMICAL CORPORATION

Stokes and Smith Company

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PHILADELPHIA 24, PA.

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USEFUL NEW BOOKS

The Consumer Mind

MOTIVATION IN ADVERTISING by *Pierre Martineau. Published by McGraw-Hill Book Co., 330 West 42nd St., New York City.* 1957, 210 *pages. Price:* $5.50.

Want to know why the consumer buys? What gets his attention? What convinces him? In this intriguing book the author provides his answers to these questions and quite a few more.

In addition, Mr. Martineau offers advice on how this motivation research can be applied to your own merchandising or advertising plans. The facets of communication, semantics, and symbolism are explored. All of Mr. Martineau's facts are based on extensive work in the field (31 years) and the information derived from a gigantic research program.

For a practical and factual look at a basic application of the much ballyhooed motivation research, food men are encouraged to take a look at Mr. Martineau's book.

A Look at Organoleptics

THE METHODOLOGY OF SENSORY TESTING. *Published by Institute of Food Technologists, 176 West Adams St., Chicago* 3. 1957. 48 *pages. Price:* $1.

Sponsored by the IFT's Committee on Test Testing and Consumer Acceptance, this booklet is compiled from contributions made at the annual meeting.

Topics of the papers presented included: Selecting a taste panel for evaluating processed milk quality, hedonic scale method of measuring food preference, methodology of the flavor profile, and others.

Papers are illustrated with charts and forms.

2-Volume Dairy Guide

TEXTBOOK OF DAIRY CHEMISTRY *(Third Edition). by Edgar R. Ling. Published by Philosophical Library, 15 E. 40th St., New York City.* 1957. 389 *pages, cloth. Price:* $12.

The twelve years that have elapsed since the second edition of this popular reference work was published have seen great strides in the field of dairy research. Dr. Ling has brought his work up to date with extensive revisions and addition of new information.

Special attention has been given to the papers and reports of leading technologists, particularly those which indicate errors or changes of thought in some fundamental theories discussed in the earlier editions.

The first volume deals with theory. It includes a discussion of milk properties, constituents, acidity, and coverage of condensed milk and milk powder.

Volume II deals with practical work in testing and analysis.

For the Laboratory Man

ADVANCES IN ENZYMOLOGY, VOLUME 18, *edited by F. F. Nord. Published by Interscience Publishers, Inc., 250 Fifth Ave., New York City* 1. 1957. 435 *pages. Price:* $9.00.

This is the most recent book in a comprehensive series on enzymology and related subjects of biochemistry. It concerns itself with a variety of topics including cytochromes as terminal oxidases in plant respiration, salt respiration, and cytochrome and photosynthesis.

The book is illustrated and indexed, both by author and topic.

Guide to Steel-Making

THE MAKING, SHAPING, AND TREATING OF STEEL. *Published by United States Steel Corp., 71 Broadway, New York City* 6. 1957. 1,048 *pages. Price:* $7.50.

This seventh edition of a massive reference work treats users and makers of steel to a comprehensive look at present day iron and steel production, from raw materials to finished products.

The result of teamwork by nearly 200 technical representatives of U. S. Steel, the book covers all the recent developments in steel making and processing including extrusion and pneumatic steel making. Steel scrap is the subject of a new section and an expanded history of the early beginnings of ferrous metallurgy is presented.

Fifty chapters offer extensive discussions of such topics as tinplate, wire, tubular products, electrical sheets, and corrosion-resistant and heat-resistant products.

Over 700 photographs and sketches are included.

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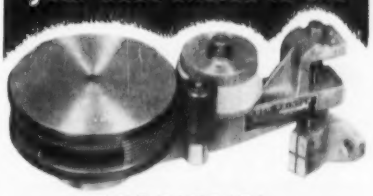

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—for automatically imprinting cartons and multiwall bags at production speeds up to 3,000 per hour.

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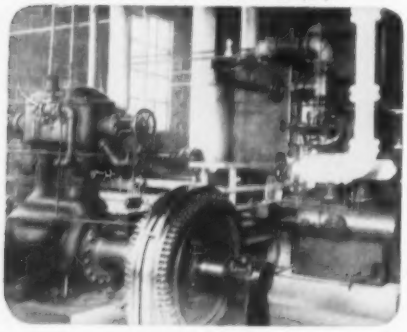
The golden apple of mythology is the symbol of this firm's celebration.

Says J. A. Hauser, president of the C. H. Musselman Co., Biglerville, Penna. Now celebrating its Golden Anniversary, the firm is one of the world's largest processors of apples, cherries, peaches, berries and tomatoes.

Beginning in 1934, the Musselman Co. has installed Frick refrigerating systems in each of its four big plants. The original Frick compressors are still running efficiently. A total of ten Frick machines are used today for process work, quick freezing and cold storage.

Two of the ten Frick refrigerating machines serving the C. H. Musselman Company.



If you want up-to-the minute cooling equipment, engineered to your special needs—whether for air conditioning, ice making, quick freezing or other refrigerating work—get in touch at once with

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
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SANITILE WALLS
at less than 1/15th the Cost of TILE

Enjoy the sanitary advantages of tiled walls and ceilings for only a few cents a square foot. SANITILE can be applied over cement, plaster, brick or wood by brush, spray or roller. Notice the high-gloss, glass-smooth surface that resists fungus, mold, grease, steam and repeated washings. Imagine the sparkling appearance of your processing rooms and coolers with a ceramic-like SANITILE surface, without joints or crevices to catch contamination and bacteria. Think of the savings over repeated paintings — on maintenance and sanitation costs. Write today for facts.

RESISTS
Steam, Condensation, water, acids, alkalies, oils & greases
RESISTS AND PREVENTS
Fungus, mold and bacteria

Serving the food industry since 1913.

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The MASTER MECHANICS Co., 2097 Columbus Road, Cleveland 13, Ohio
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Guarding Frozens Quality

THE FREEZING PRESERVATION OF FOODS, VOLUME II (*Cooked and Prepared Foods*) *by Donald K. Tressler and Clifford F. Evers. Published by AVI Publishing Company, Inc., 7 Taylor Place, Westport, Connecticut.* 1957. 559 *pages. Price:* $10.

This second volume rounds out the coverage of freezing preservation of foods. Profusely illustrated with tables, diagrams, and charts, the book offers a wealth of information for food technologists, quality control people, packers and warehousemen, and all those who deal with frozen foods.

Chapters cover dehydrofreezing, selecting fruit varieties for freezing, freezing vegetables, meat, game, fish, and shellfish.

Among topics discussed are special problems encountered in preparing freezing, storing, transporting and marketing frozen and precooked and prepared foods, packaging of frozen foods, and the equipment necessary.

Answering a Need

STRENGTHENING SCIENCE EDUCATION FOR YOUTH AND INDUSTRY *published by New York University Press, Washington Square, New York* 3. 1957. 162 *pages. Price:* $5.00.

Much has been made of the shortage of engineers and technologists. The papers compiled in this book, presented by leading scientists and industrialists as well as educators, were those presented at the Seventh Institute of the Thomas Alva Edison Foundation.

Meeting in 1951 the organization devoted its time to the problem of maintaining technological progress by strengthening science education.

Among the topics discussed were factors in the early motivation of scientists, dilemmas of engineering education caused by research needs, and outlining the needs of industry and science education.

Booklets and Reports

MANAGEMENT AND THE MANPOWER OUTLOOK (*Management Report #234*). *Published by California Personnel Management Association, Berkeley* 4, *California.* 1955. 12 *Pages. Price:* $1.00. Stenographic brief of address by John R. Steelman, consultant and adviser on industrial relations and economic problems.

FLAVOR CHANGES INDUCED BY RADIATION STERILIZATION. (PB 121925) Published by The U. S. Department

Ac'cent Flavor-Gram

CAPSULED NEWS FROM THE WORLD OF FLAVOR

✓ FLAVOR CAN NO LONGER TAKE A BACK SEAT, now that processed food sales exceed that of fresh foods, reports Dr. Emil M. Mrak* (Chairman, Dept. of Food Technology, U. of Calif.). Today's processor must compete for the consumer by giving him more taste for his sales dollar. Already large food manufacturers are awakening to this fact and are devoting more attention to flavor factors.

*Chemistry of Natural Food Flavors: A symposium sponsored by the National Academy of Sciences, National Research Council, May, 1957.

✓ HOW DO YOU BUILD A 3 TO 1 CONSUMER PREFERENCE? Star-Kist Foods of Los Angeles answer—uniqueness in quality control and in flavor. They dog-tag the catch of each boat and keep a complete record till the fish are shipped. Their flavor exclusive is that they're the only tuna packer to add monosodium glutamate. They find that Ac'cent is easy to use because the crystals are similar to vacuum butter salt and both can be easily combined. Result: Star-Kist is a 3 to 1 favorite with consumers in taste test polls.

✓ FLAVOR SYMPOSIA. The fourth symposium, "Physicochemical Research on Flavor", sponsored as a part of the 70th anniversary of Arthur D. Little, Inc. of Cambridge, Mass., was held in Chicago, Oct. 14. Others in this series of symposia were "What is Flavor?", "Laboratory Flavor Testing" and "Consumer Product Testing."

✓ NEW NO. 2 LEADER IN SEASONINGS! September's "Chain Store Age" lists black pepper as still the number one volume seller in chain stores—but a new second has jumped up from the ranks—monosodium glutamate! Although there are many brands of black pepper, it is interesting to note there is only one widely-available brand of monosodium glutamate—Ac'cent.

✓ FROZEN FOODS LIVE LONGER WHEN GLUTAMATE IS ADDED. In a 12-month test*, it was found that when Ac'cent was added to frozen foods before freezing, foods could be stored longer, flavor was improved, and in many instances, color was brightened. By building the glutamate contained naturally in foods, Ac'cent captures flavors at their peak and holds those flavors through longer periods of frozen storage. Ac'cent, pure monosodium glutamate, is stable . . . retains natural food flavors through freezing, canning and storing.

*"The Use of Monosodium Glutamate in Frozen Foods" by Norton, Tressler & Farkas, FOOD TECHNOLOGY, Nov., 1952.

✓ FLAVOR IS THE MAIN BUSINESS OF AC'CENT•INTERNATIONAL. These monthly reports on new developments and happenings in the Food Processing Industry are just one of the many services we offer you.

As the American pioneer in the development of monosodium glutamate, let our experience, our qualified personnel, research and technical facilities help you solve your flavor problems.

If you would like to know more about the news items reported here, just drop a line on your letterhead to Technical Service Dept., Ac'cent•International, 20 N. Wacker Drive, Chicago 6, Ill.

Ac'cent® BRAND PURE MONOSODIUM GLUTAMATE

AC'CENT - INTERNATIONAL, Division of International Minerals & Chemical Corp.

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214 Front Street
San Francisco 11, Calif.
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20 N. Wacker Dr.
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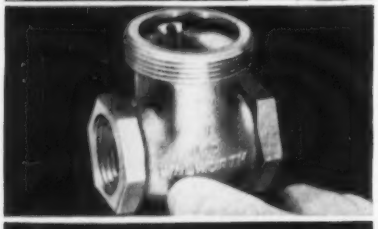
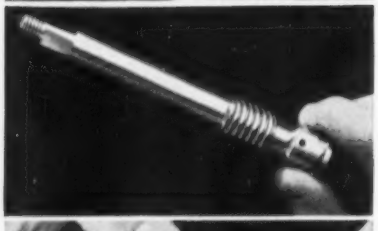
Here's what makes Walworth Bronze Valves *the* real bargain!

TYPICAL OF WALWORTH QUALITY is the union body-to-bonnet connection which stiffens the body against internal pressure; makes taking the valve apart a simple operation and reduces the chances of distortion or leakage even though the valve is repeatedly taken apart and reassembled. With this type of construction there is no possibility of the bonnet coming off the valve while the handwheel is being turned.



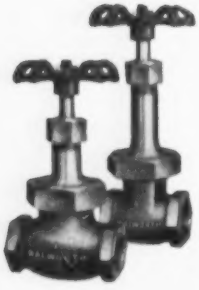
HEAVY BODY CONSTRUCTION is typical of *all* Walworth Bronze Valves. Extra-thick walls and rugged wrench hexes constitute a high safety factor and prevent distortion while the valve is being installed in the pipeline. Extra-deep pipe threads are accurately machined to eliminate leakage. Walworth Bronze Valves are also available with flanged, silver-brazed or soldered ends in certain sizes and types.



EXTRA-LARGE STEMS with extra-long, extra-deep threads prolong valve life, protect against wear and distortion and provide tight positive shutoff. The surface of the stem is machined to a glass-like finish for minimum handwheel effort and to preserve the packing which results in fewer inspections and less maintenance. The top of the stem is tapered and squared to hold the handwheel securely.

TO REDUCE WIRE DRAWING to a minimum, certain types of bronze globe valves have stainless-steel plug-type seats and discs heat-treated to a nominal hardness of 500 Brinell, adding years to valve life even in severe services. These valves can be tightly closed on sand, grit or pipe scale without damage. Seats and discs are machined simultaneously, assuring perfect mating.

There is a Walworth Bronze Gate, Globe, Angle or Check Valve for every service. Walworth is continually developing new valve types and materials, including plastics, to keep pace with the growing variety and severity of services in modern industry. For full information, see your Walworth Distributor or write: *Walworth, 60 East 42nd Street, New York 17, N.Y.*



WALWORTH

Bronze Valves and Fittings

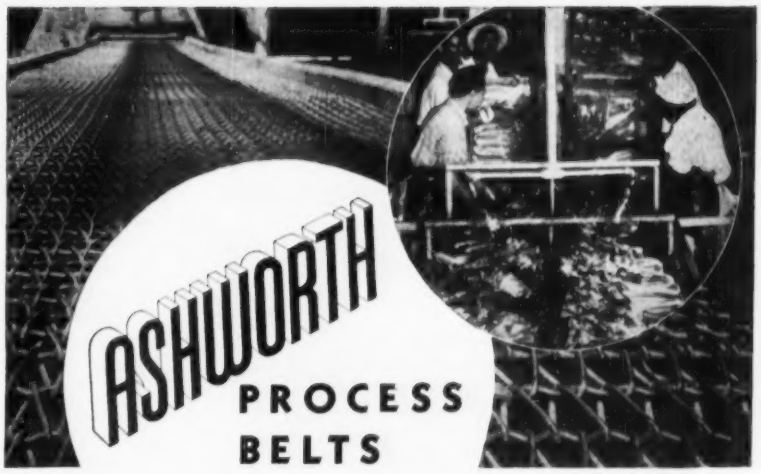
of Commerce, Washington 25, D. C. 1957, 65 Pages, Price: $1.75. Report on Research conducted by Stanford Research Institute.

EFFECTS OF NUCLEAR EXPLOSIONS ON CANNED FOODS, (WT-1212). *Published by U. S. Department of Commerce, Washington 25, D. C.* 1956. 89 *Pages, Price:* $.50. Report on tests made during Operation Teapot.

INFRA-RED, A LIBRARY OF CONGRESS BIBLIOGRAPHY, *Part II* (PB-121998). *Published by U. S. Department of Commerce, Washington 25, D. C.* 1957. 156 *Pages, Price:* $3.00. References to reports and documents issued from 1931 to 1952.

A FOOD STERILIZATION REACTOR, REACTOR DESIGN AND FEASIBILITY PROBLEM (see F-55-8-190). *Published by U. S. Department of Commerce, Washington 25, D. C.* 1957. 151 *Pages, Price:* $.80. Report of research in the field of nuclear reactors.

SUGAR STATISTICS. *Published by U. S. Department of Agriculture, Washington 25, D. C.* 1957. *No charge.* Revised Volume I of two volume publication, bringing 1953 edition up to date.



Fabricated from the correct type of wire for the job, and in a full range of mesh specifications and designs, Ashworth belts are effecting savings in continuous processing in BLANCHERS — BRINE TANKS — COOKERS COOLERS — CUTTING TABLES — DESANDERS — DRYERS — EVAPORATORS — INSPECTION TABLES — PACKING — PEELING AND CORING — SPRAY WASHERS — STERILIZERS — WEIGHING.

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THE IMPROVED PENNSYLVANIA "TAX CLIMATE"

An Important Message for

MANUFACTURERS • DISTRIBUTORS • INDUSTRIAL REALTORS
MANAGEMENT AND ENGINEERING CONSULTANTS

Pennsylvania, this year, has taken major steps to create a "tax climate" favorable to new industry and expansion of established industries.

The 1957 Session of the General Assembly (the Commonwealth's legislature) which adjourned in June made the following basic tax changes:

1. Exempted manufacturers from the capital stock and franchise taxes;
2. Completed, state-wide, the elimination of machinery and equipment from local, ad valorem property taxation (there is no state-level general property tax in Pennsylvania);
3. Repealed the tax on stock transfers;
4. Made the temporary 3 per cent rate of the Pennsylvania Sales Tax permanent—now the principal source of Commonwealth revenues;
5. Reduced the sales tax on purchases made by manufacturing firms.

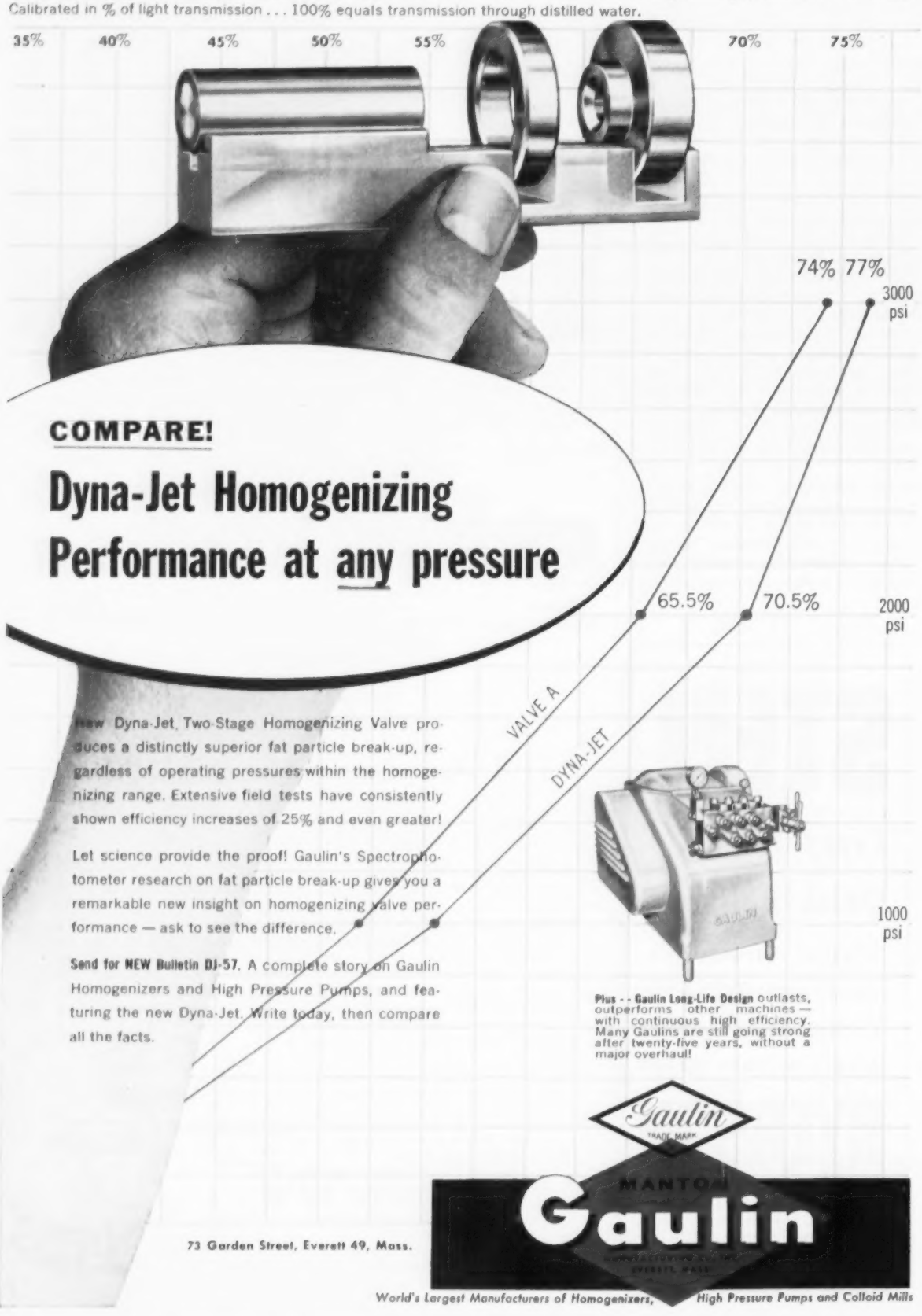
These changes, plus the absence of a state personal income tax, and the growing dependence of localities on non-property taxes, mean major "advantages", taxwise, to companies locating or expanding in Pennsylvania.

Get the whole story of Pennsylvania's new tax advantages. Send for booklet entitled "The Improved Pennsylvania Tax Climate"

Write to:

Pennsylvania Dept. of Commerce
Main Capitol Building
981 State Street,
Harrisburg, Pennsylvania
Telephone CEdar 4-2912.

Spectrophotometer graph showing fat particle break-up of milk as homogenizing pressures increase.
Calibrated in % of light transmission . . . 100% equals transmission through distilled water.



COMPARE!

Dyna-Jet Homogenizing Performance at any pressure

New Dyna-Jet Two-Stage Homogenizing Valve produces a distinctly superior fat particle break-up, regardless of operating pressures within the homogenizing range. Extensive field tests have consistently shown efficiency increases of 25% and even greater!

Let science provide the proof! Gaulin's Spectrophotometer research on fat particle break-up gives you a remarkable new insight on homogenizing valve performance — ask to see the difference.

Send for NEW Bulletin DJ-57. A complete story on Gaulin Homogenizers and High Pressure Pumps, and featuring the new Dyna-Jet. Write today, then compare all the facts.

Plus - - Gaulin Long-Life Design outlasts, outperforms other machines — with continuous high efficiency. Many Gaulins are still going strong after twenty-five years, without a major overhaul!

Gaulin TRADE MARK

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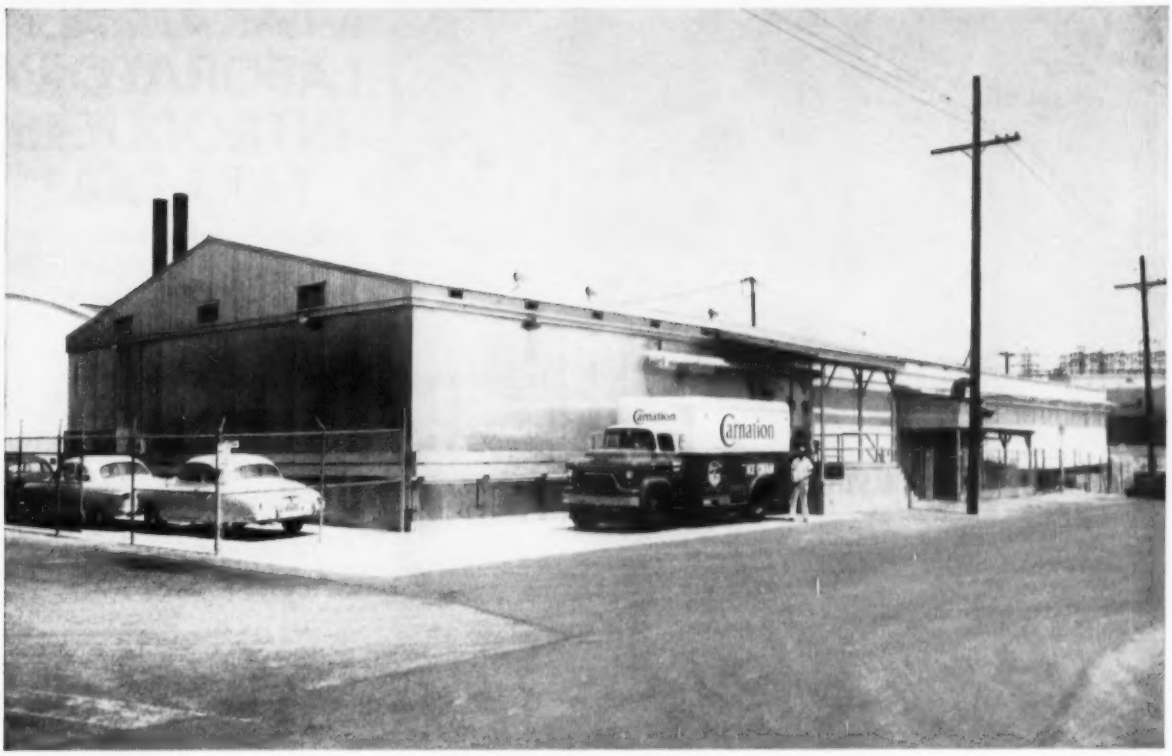
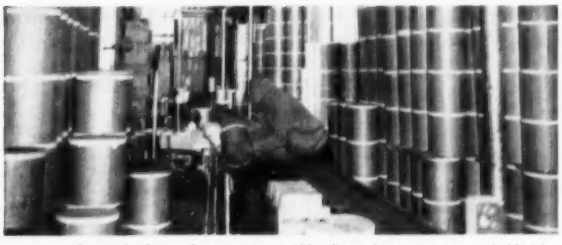
World's Largest Manufacturers of Homogenizers, High Pressure Pumps and Colloid Mills



Carnation, Inc.'s two adjacent freeze boxes in Los Angeles plant have a combined floor area of over 5,000 sq. ft., maintain a minus 25° temperature. Boxes are mounted on a concrete slab with Armorply in ceilings and walls. Peaked roofs deflect direct sun and aid rain drainage. Firm has had no maintenance expense on Armorply since the first box was installed in 1950. Armorply freeze box modules manufactured by ANNAPOLIS YACHT YARD, FREEZER BOX DIVISION, Annapolis, Md.

"Armorply simplifies construction, gives us a movable freeze box that requires no maintenance"

says JOHN FORSLAW, Ass't Vice President for Engineering, Carnation, Inc., Los Angeles, California



Armorply freeze box stores up to 30 gallons of ice cream per sq. ft. Modular panels are jointed with patented locking device, then seams are covered with aluminum strips. Smooth, easy-to-clean sections can be disassembled and moved quickly with ordinary labor.

"BESIDES needing a material that would maintain sub-zero temperatures in our freeze boxes," explains Mr. Forslaw, "we required one that would give us a box that could be easily expanded or dismantled and moved, depending on market demands for our fresh milk and ice cream."

Carnation built its first Armorply freeze box in 1950, found they could erect their boxes with "a minimum of trouble, material, labor, and time" with the modular Armorply panels. Armorply virtually eliminates maintenance costs, too—"requires no special cleaning and stands up to all kinds of weather conditions."

Carnation used 4-foot-wide Armorply panels of ¼-inch Weldwood waterproof plywood with faces of aluminum bonded to one side. Lightweight, remarkably strong, and easy to fabricate, Armorply makes possible cold rooms that are comparable in cost to ordinary plaster and insulation units yet provides the extra advantages of movability and no maintenance.

You can also specify Armorply with faces of stainless steel, zincbond steel, copper, or any other metal laminated to a variety of cores. Send the coupon for details and your free sample of Armorply.

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A look into the versatile abilities of Takamine Enzymes will help in the final analysis of your products at the market-place.

If you are plagued with processing or stability problems involving starches, pectins, proteins, glucose (browning reaction) or oxidative changes, Takamine Enzymes will speed operations, control viscosity, enhance flavor and taste and improve storage stability.

Takamine Enzymes serve you in *two ways* — they promote smooth processing operations *and* give your product a *selling personality.*

Send for our complete technical bulletins regarding your product or problem. Please address inquiries to our Technical Service Department.

Takamine Enzymes make it taste better, look better, sell better

DIASTASES
for liquefaction and hydrolysis of starch to produce soluble dextrins and sugars—also, to remove starch causing filtration problems and turbidity.

GLUCOSE-OXIDASE
to prevent browning due to glucose or oxygen and to increase shelf-life of food and beverage products.

PROTEINASES
for the modification and hydrolysis of proteins in food manufacturing and pharmaceutical operations.

PECTIC ENZYMES
for the hydrolysis of pectins in fruit and fruit juices to speed processing and to make fruit juices sparkling clear for consumer appeal.

TAKAMINE

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TAKAMINE LABORATORY INTRODUCES TAKATABS

Takamine Laboratory, Division of Miles Laboratories, Inc., is marketing isoascorbic acid as effervescent tablets, TAKATABS, to the food industry.

TAKATABS afford the user a convenient, accurate way to use sodium isoascorbate, an effective antioxidant. The tablets eliminate waste, handling of bulk containers and weighing. Two (2) TAKATABS form approximately 7/8 oz. sodium isoascorbate in solution. They offer the following advantages:

- Accurate—premeasured, uniform addition to isoascorbate.
- Convenient—easy to handle, no paper to tear or dispose of, no handling of drums.
- Economical — eliminates waste, errors, spillage and use of excess amounts.
- Fast—dissolves quickly, eliminates mixing and need for stock solutions.
- Time Saving—eliminates weighing and handling.
- Versatile—can be used in comminuted products and curing pickle.
- Safe—no harmful fumes formed.

M.I.B. APPROVED

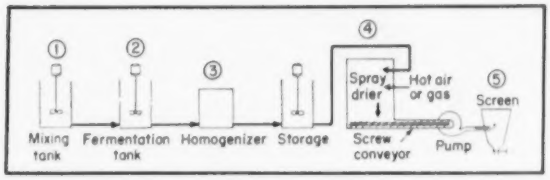
Sodium isoascorbate is used in the preparation of food products such as meat, frozen fruits and vegetables, frozen fish, beer and carbonated beverages.

TAKATABS are packaged 100 to the box, 10 boxes per case. Takamine Laboratory has set up centrally located warehouses to provide prompt delivery anywhere in the U. S.

A technical bulletin on TAKATABS, TL-400, and a handy wall chart for use in meat packing plants are available from Takamine Laboratory, Clifton, N. J.

← For more data, circle this page number on card at back

RECENT INVENTIONS



Dehydrated Dough Sponge Made by Spray-Drying

Per 100 lb. of flour, process involves mixing bread flour with 3-6% yeast, 185-200% water (1); fermenting viscous dough to a liquid sponge (2); homogenizing (3); spray-drying, keeping product temperature between 120-140F. (4); screening (5).—*D. A. Battiste, Philadelphia. No. 2,808,334. Oct. 1, 1957.*

PROCESSES

Recovering Araban From Sugar-Beet Pulp by Digesting With Lime, Introducing Carbon Dioxide, Separating Clear Liquor, Drying—H. S. Owens, Berkeley and A. E. Goodban, Walnut Creek, Calif. to USDA No. 2,803,567. Aug. 20, 1957.

Preventing Rancidity in Ground Coffee by Macerating With Cold Aqueous Solution of Wax-Solidifying Agent—L. C. Tarasch, N. Miami Beach, Fla. No. 2,804,389. Aug. 27, 1957.

Curing Kraut in Open-Top Tank by Covering With Plastic Sheet (Impervious to Water, Gas, and Air) to Form Slack Center Portion While Permitting Escape of Fermentation Gases, Applying Flowable Weighting Agent—H. B. Kauble to Clyde Kraut Co., Clyde, Ohio. No. 2,804,390. Aug. 27, 1957.

Purifying, Deodorizing Preheated Oils by High-Vacuum Steam Stripping—J. F. Suriano, Chicago. No. 2,804,427. Aug. 27, 1957.

Processing Olives by Treating With Sodium Hydroxide Solution, Aerating, Water-Washing—W. H. Kagley, H. H. Wylie, and R. Webster to Lindsay Ripe Olive Co., Lindsay, Calif. No. 2,805,951. Sept. 10, 1957.

Pasting Starch Continuously by Impacting Radially Confined Slurry With Radially Expanding Steam Jet—O. R. Etheridge to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,805,966. Sept. 10, 1957.

Densifying Food Powders by Continuously Removing Air Through Vacuum Filtration—C. R. Cuthbertson and O. L. Bertorelli to J. M. Huber Corp., Borger, Tex. No. 2,806,771. Sept. 17, 1957.

PRODUCTS

Granular Potato Product Prepared by Slicing and Trimming Washed Unpeeled Spuds, Pre-Cooking, Dry-Heating, Cooling, Forming Product Into Strings, Dehydrating, Crushing—A. Medriczky to Potagrain Foods Refining Corp., N.Y.C. No. 2,798,815. July 9, 1957.

Smooth Protein-Food That Simulates Baby Food Meat Comprising Heat-Treated Suspension of Coagulated Vegetable Protein, Proteolytic Enzyme Digestion Products Thereof—M. L. Anson, New York City and M. Pader, West Englewood, N. J. to Lever Bros. Co., New York City. No. 2,802,738. August 13, 1957.

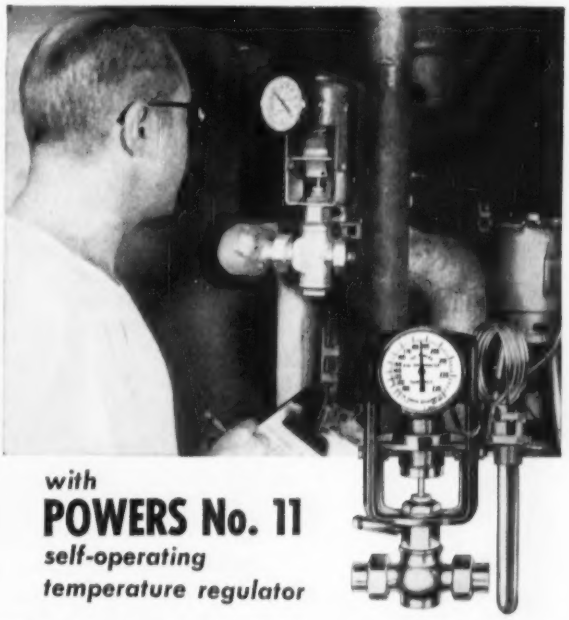
Tenderizing Solution, for Injecting Freshly Killed Dressed Animal Carcasses, Comprising Glutamate Salts, Proteolytic Enzyme—B. E. Williams, San Mateo, Calif., and B. F. Buchanan, Wheaton, Ill., to International Minerals & Chemical Corp. No. 2,805,163. Sept. 3, 1957.

Frozen Swiss-Cheese Culture Made From Whey Medium of *S. thermophilus* (Free of Lactobacilli, Yeasts, and Molds), Plus Milk Powder—A. B. Erekson, Lafayette, Calif., to Borden Co., N.Y.C. No. 2,805,950. Sept. 10, 1957.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

VISIBLE PROOF

of constant temperature control



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This big four-inch dial gives a quick, visual means of checking controlled temperatures . . . an accurate guide for regulator adjustment.

Designed for precise temperature control, the Powers No. 11 Regulator is self-powered...simple, compact and dependable. Full throttling action is gained without the aid of *any* external power source. Special valve stem lubricator eliminates binding. Big double ply metal bellows provide extra valve power — longer life. Union body assures easy installation.

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son, Lafayette, Calif., to Borden Co., N.Y.C. No. 2,805,950. Sept. 10, 1957.

Stainless-Steel Cleanser Consisting of Aqueous Phosphoric Acid Solution With Ferric Ion Other Than an Iron Halide—M. A. Streich to E. I. du Pont de Nemours & Co., Wilmington. No. 2,806,000. Sept. 10, 1957.

EQUIPMENT

Frozen-Foods Grinder Comprising Hopper, Feed Throat, Barrel, Spiral Cutting Worm, —T. Autio, Astoria, Ore. No. 2,796,901. June 25, 1957.

Marshmallow Former Comprising Cutter and Mold.—W. C. Rade, Long Beach, Calif. No. 2,797,653. July 2, 1957.

Fruit Peeling Machine Comprising Two Curved Blades With Overlapping End Portions Aligned for Independent Pivoting Movement in a Common Plane—A. J. Bardini to Food Machinery and Chemical Corp., San Jose, Calif. No. 2,800,937. July 30, 1957.

Berry-Slicer Employing V-Shaped Troughs, Rotary Knives —A. B. McLauchlan to A. B. McLauchlan Co., Salem, Oregon. No. 2,800,938. July 30, 1957.

Asparagus Trimming Machine Having Endless Compartmented Conveyor, Means for Severing Ends to Make Uniform Lengths—M. C. Vance, Grandview to Prosser Packers, Inc., Prosser, Wash. No. 2,800,939. July 30, 1957.

Egg-Oiling Machine Comprising Endless Conveyor Running Through Hood Having Microswitch-Actuated Spraying Means—R. M. Hensen, Adrian, Minn. No. 2,801,606. Aug. 6, 1957.

Food-Peeler Comprising Rows of Transversely Mounted Rollers With Resilient Surfaces—W. G. Carter, Yakima, Wash. to California Packing Corp., San Francisco. No. 2,801,659. Aug. 6, 1957.

Vegetable Trimming Machine Employing Conveyor Having Pockets, Shearing Blade, Crowder Adapted for Pushing Products in Pockets Into Shear —E. J. Brunnier, Salinas, Calif. to D'Arrigo Bros. Co. of Calif., San Jose. No. 2,801,662. Aug. 6, 1957.

Pastry-Cutting Machine Adapted for Mounting Above a Conveyor Table, Comprising Crank-Shaft Driven Vertical Swinging Cutting Arms—W. F. Hoagland, Klamath Falls, and R. E. Doty, Medford, Oregon. No. 2,802,431. Aug. 13, 1957.

Milk Carton Carrying Case of Stackable Wire-Work—E. C. Voight, Chicago. No. 2,802,589. Aug. 13, 1957.

Charging Device for Fish Processing Apparatus Comprising Conveyor, Trough, Gill-Guide bar, Gripper, Locking Device—A. F. A. Bartels and P. F. W. Jobmann, to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany. No. 2,803,035. Aug. 20, 1957.

Pea-Shelling Apparatus Comprising Angular Prism, Reller Members, Drive Means—F. E. Wood, Houston, Texas. No. 2,803,254. Aug. 20, 1957.

Bun-Slicer Having Adjustable Saw Blades—D. K. Strand, to Stevens Sales Co., Galesburg, Ill. No. 2,803,279. Aug. 20.

Container Emptying Apparatus Including Infeed Chute, Pair of Oppositely Rotating Members That Cause Containers to be Crushed and Extrude Their Contents—W. S. Edwards, Hamden, Conn. to National Dairy Products Corp., New York City. No. 2,803,361. Aug. 20, 1957.

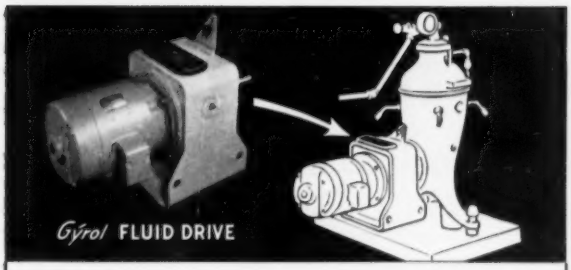
Dispensing Unit for Making Two-Flavored Confections, Comprising Plate Members With Spaced Delivery Tubes—M. Vouderis, Jackson Heights, N. Y. to Joe Lowe Corp., New York City. No. 2,803,381. Aug. 20, 1957.

Chip-Ice Machine Employing Cylindrical Freezing Evaporator, Conveyor, Water-Injecting and Ice-Discharge Means—J. R. Bayston, Van Nuys, Calif. No. 2,803,950. Aug. 27, 1957.

Magnetic Sp.-Gr. Meter Comprising Container, Weighted Float, Electrical Operating Means—J. R. Hart, College Park, Md. No. 2,803,960. Aug. 27, 1957.

Cross-Grain Dough Molder With Transverse Belt Conveyors, Recessed Plate, Stop Member—J. A. Boston, York, to Capitol Products Corp., Mechanicsburg, Pa. No. 2,804,026. Aug. 27, 1957.

Dryer for Long Alimentary Pastes Consisting of Enclosure,



ADJUSTABLE-SPEED *Gyrol* FLUID DRIVES PROTECT SEPARATOR MOTORS

The extended accelerative cycle of many separators makes motor maintenance a problem. Special motors and controls designed for long acceleration are costly. Gyrol Fluid Drive with a straight induction motor permits motor to be started unloaded; the separator can then be accelerated smoothly and positively by the Gyrol.

The advantages of a Gyrol Fluid Drive — adjustable speed, no-load starts, cushioned power, automatic control — will help smooth your production. Call our nearest branch office for full data. Or write: American Blower Division of American-Standard, Detroit 32, Michigan. In Canada: Canadian Sirocco products, Windsor, Ontario.

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Division of AMERICAN-Standard

High-capacity, new sifter solves many problems

Dust-tight — can be made gas-tight!

Only from 28 inches to 45 inches headroom required!

Screen readily accessible for rapid cleaning!

Carbon steel construction — stainless steel parts available!

Write For Bulletin 160

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EQUIPMENT FOR SIZE REDUCTION, MIXING & BLENDING, PELLETING & CUBING, BULK MATERIALS HANDLING, PRODUCT CLASSIFICATION

Save More . . . AUTO-MATE!

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NOW! POPULAR PRICE

Quality Floor Maintenance Machines

General KC Extra Heavy Duty Machines with all these deluxe quality PLUS features

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Full range of sizes — from 13" to 23" diameter operating brush spread.

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Model 66 and 55

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13" diameter operating brush spread. Portable!

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T-16B—for Motels, Stores, etc.

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BEFORE YOU BUY, SEE GENERAL! There's a BIG difference in floor maintenance equipment!

***General* FLOORCRAFT, INC.**

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World's Most Complete Line of Industrial and Household Floor Maintenance Machines and Vacuums

All Sizes for All Types of Floors — Made by Floor Machine Specialists

DON'T WAIT —AUTO-MATE your floor maintenance! Mail coupon for details.

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FE-11

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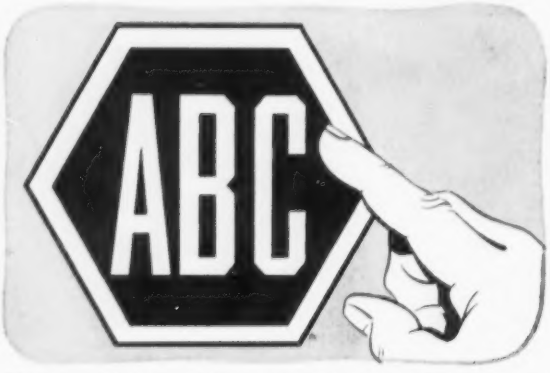
The Audit Bureau of Circulations (ABC) is a cooperative organization that sets standards of good business conduct for its publisher members. Twice each year ABC auditors carefully scrutinize the entire circulation structure and operation of every member magazine. In a very real sense, therefore, they are "minding the store" — making sure that no false or misleading claims are made regarding the size or composition of a magazine's audience.



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McGRAW-HILL PUBLISHING COMPANY, INC.

330 WEST 42ND STREET, NEW YORK 36, N. Y.

Three-Tier Conveyor System, Warm-Air Circulating Means—J. Coffaro to De Francisci Machine Corp., Brooklyn, N. Y. No. 2,804,697. Sept. 3, 1957.

Pea, Bean Sheller Having Feed Hopper, Shelling Rollers, Sliding Plate, Inverted V-Shaped Parallel Guides—W. R. and L. R. Williams, Birmingham, Ala. No. 2,804,873. Sept. 3, 1957.

Fowl-Picking Unit Employing Bird-Holding Means, Rotating Flexible Beaters—A. J. Toti, Modesto, Calif., to Honolulu Oil Corp. No. 2,805,443. Sept. 10, 1957.

Continuous Extruder Including Plurality of Pumps, Controls—B. T. Hensgen and H. G. Reichel to Swift & Co., Chicago. No. 2,805,444. Sept. 10, 1957.

Vegetable Slicer Comprising Container, Power-Driven Rotary Cutter, Product-Discharge Means—P. J. Nieland, S. St. Paul, to Hurricutter, Inc., Minneapolis. No. 2,805,697. Sept. 10, 1957.

Food-Molding Container Having Elongated Tubular Body, Rectangular Cross Section, Metallic Frame at Upper End, Depending Skirt, Clampable Cover—N. J. Allbright and R. W. Illsley to Allbright-Nell Co., Chicago. No. 2,805,788. Sept 10, 1957.

Patty-Forming Attachment to Meat Grinder Consisting of Cylindrical Shaper With Restrictive Neck, Tapering Portion, Outlet—H. B. Shadid, Oklahoma City, Okla. No. 2,806,247. Sept. 17, 1957.

Egg Candler Employing Stationary Frame With Arcuate Aperture, Rotating Egg-Support Table, Lamp—J. L. Stucky, McPherson, Kan. No. 2,806,403. Sept. 17, 1957.

Hydraulic Pasteurizer Consisting of Elongated Water Chamber Having Closed Side Walls, Steam Section, Article Conveyor With Spaced Partitions—J. B. van der Winden, Nieuwer Amstel, to Gebr. Stork & Co.'s Apparatenfabriek N. V., Amsterdam, Netherlands. No. 2,806,423. Sept. 17, 1957.

Centrifugal Nut Cracker Including Semi-Cylindrical Housing Liner, Journaled Disks, Blades, Anvil—E. T. Waring, Woodburn, Ore. No. 2,806,496. Sept. 17, 1957.

Fish-Cutting Machine Having Trough-Conveyor, Stations for Gaging, Cutting, Pressing Down, Washing.—A. C. Walker, Bath, to J. B. Crane, Milbridge, and H. E. Walker, Bath, Maine. No. 2,799,043. July 16, 1957.

Berry-Stemmer Formed With Hopper Feeding Rotatable Helically-Grooved Carrier With Fabric Lining, Rubber Air Tubes.—P. F. Ervin, Topeka, Kan. No. 2,799,312. July 16, 1957.

Juice-Extractor Comprising Rotor With Conical Upper Surface, Cylindrical Feed Throat Sleeve, Annular Pulp-Receiving Rim, Separating Ring, Juice Passages.—A. C. to A. K. Schwarz, Menlo Park, Calif. No. 2,799,313. July 16, 1957.

Candied-Apple Maker Including Drive Means, Apple Clamp, Stick Inserting Means.—W. A. Raimondi, Cicero, Ill. No. 2,799,857. July 23, 1957.

Meat-Cleaning Machine Having Rotary Brush Extending Through Opening in Flat Surface, Brush-Cleaning Structure.—K. H. Scott, Oklahoma City, Okla. No. 2,799,877. July 23.

Patty Molding Machine Having Reciprocable Horizontal Slide, Feed Means, Plunger, Electrical Operating Means.—A. Esper, Worcester, Mass. No. 2,799,893. July 23, 1957.

PACKAGING

Package Comprising Row of Cone-Top Cans, Each Having a Cap Closure Formed With a Downwardly Directed Flange, Holder—R. S. Wolowicz to Container Corp. of America, Chicago. No. 2,801,001. July 30, 1957.

Combined Container and Heating Means Therefore, Having Closed-Bottom Heater Housing With Fuel-Supporting Ledge, Igniting Element—F. T. Burke and R. E. Eckman, Philadelphia. No. 2,801,627. Aug. 6, 1957.

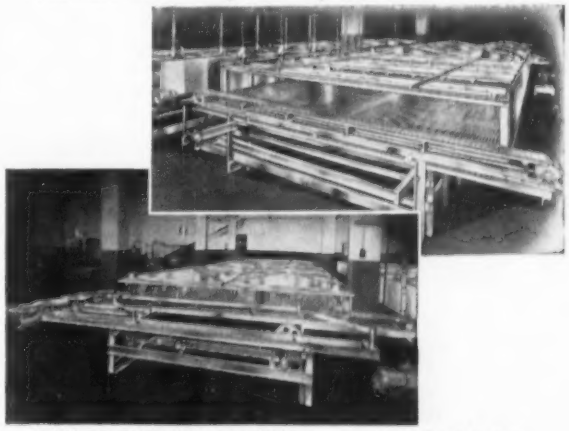
Assembling Cartons in Units of at Least Two by Alternately Interleafing Flaps—R. Gelin, Wantagh, N. Y. to General Foods Corp., White Plains, N. Y. No. 2,802,614. Aug. 13, 1957.

Assembling Food Units Into a Group Falling Within a Given Weight Range by Successively Weighing and Add-

The CAMCO "WALKING BEAM" UNIT

FOR FOOD PROCESSING

Positive, High speed fully automatic Cooking, Pasteurization and Cooling of all containers for Vegetables, Fruits, Jams, Pickles, Juices, Nectors and many other products.



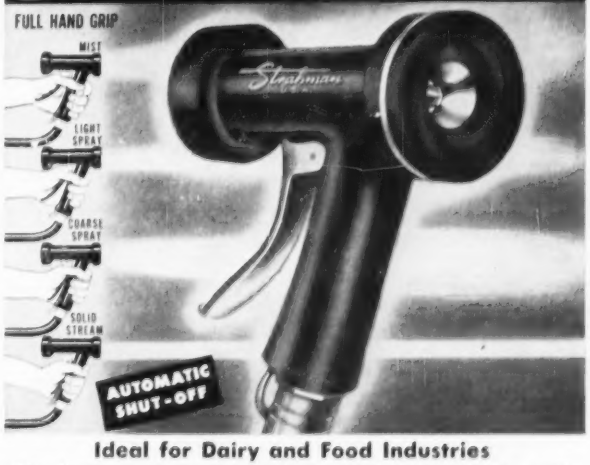
CAMCO-THERMAL-SYSTEMS, guarantee Precise-Uniform equal treatment of each container.

Manufactured By

CANNING MACHINERY COMPANY

Portland, Oregon 4525 S. W. Lee St. ☆ San Francisco, Calif. 244 California Street ☆ Chicago, Illinois 5807 W. North Ave. ☆ Hillside, New Jersey 360 Wierimus Road

Strahman AUTOMATIC WATER-SAVER SPRAY NOZZLE



Ideal for Dairy and Food Industries

The Strahman Spray Nozzle does a better job with the least amount of water. This precision made nozzle enables the operator to get any type stream of water to do his job by simply pressing the lever. A soft spray is sent forth with slight pressure on the lever, and a strong straight stream may be had by pushing the lever all the way down. This convenient control of the wash water assures better cleaning with a lot less effort. The nozzle automatically shuts off the moment the lever is released, thereby eliminating all waste of water.

RENEWABLE RUBBER COVER. The sturdy cover protects the nozzle and your equipment against knocks and dents. When the cover becomes worn, replace it with a new one.

CONSULT YOUR DEALER

STRAHMAN VALVES, INC., 18 HUDSON STREET, NEW YORK 13, U. S. A.

NEW

concentrated source of

FLAVOR

goes

FURTHER!

Saves money as it improves taste in:

- Canned Meats
- Soups & Stews
- Baked Beans
- Chili Con Carne
- Corned Beef
- Steak Sauces
- Gravies
- Chop Suey Sauce
- Frozen Meat Pies
- Sausages

Staley's HVP* boosts eye appeal—adds natural meat-like flavor that builds sales.

**Hydrolyzed Vegetable Proteins*

Want to improve the flavor, looks, over-all sales appeal of your products—at a saving? Just add Staley HVP to your recipes and you'll notice a decided difference.

Taste how Staley's new HVP adds an appetizing meat-like flavor. A uniform, better balanced flavor that enhances taste appeal—puts a distinctive zing in a variety of products. Notice how the greater flavor solids concentration goes further—actually saves you money. Notice too, how Staley's HVP is free from sales-robbing, taste-robbing separating and settling characteristics.

Investigate now how Staley's HVP can give your products an appetite appeal that builds repeat sales. Write today for complete application data and SAMPLE.

A. E. Staley Mfg. Co., Decatur, Ill.

Branch Offices: Atlanta · Boston · Chicago · Cleveland · Kansas City New York · Philadelphia · San Francisco · St. Louis

ing Increments—B. T. Hensgen and W. E. Palmer, Chicago, and R. M. Faust, Westchester, Ill. to Swift & Co., Chicago. No. 2,802,658. Aug. 13, 1957.

Preparing a Meat Package by Heating and Stretching Plastic Film to Orient It About a Chunk of Food Having a Planar Surface, Leaving Unoriented Film About Sides, Heating to Form Skin-Tight Covering—E. E. Ellis, Chicago to Tee-Pak Inc. No. 2,802,743. Aug. 13, 1957.

Vacuum Packaging of Meats Wherein a Tube of Heat-Sealable Material Is Formed With Product Inside at Spaced Intervals, Forming Partially-Finished Unit Sealed in Controlled Atmosphere Chamber — K. D. Aalseth, Downers Grove, Ill., to Swift & Co., Chicago. No. 2,803,100. Aug. 20, 1957.

Egg-Carton Consisting of Single Sheet of Foldable Material Creased Along Fold Lines — R. P. Bemiss, Burlinghame and A. R. Reichard, Redwood City, Calif. to W. D. Lynch, New York City. No. 2,803,392. Aug. 20, 1957.

Loader for Open-Ended Cartons Having Hinged Can-Chime Retaining Tab Within Wall Contour—B. J. Nigrelli, Skokie, W. E. Standley and R. B. Wittmann, Chicago, and B. K. Snyder, Clarendon Hills, Ill., to R. W. Johns, B. J. Nigrelli, and R. R. Johns, Chicago. No. 2,803,932. Aug. 27.

Carton Closer Employing Back-of-Carton Engaging Member, Pivoting Presser and Support Plates—A. R. Lubersky, Mill Valley, Calif., to Fibreboard Paper Products Corp. No. 2,803,934. Aug. 27, 1957.

Reclosable Container Comprising Tubular Cylindrical Body With Circumferential Tearing Strip, Interior Collar Forming Locking Shoulders, Closure Member—G. W. Wigert, Union, N. J., to American Can Co., N.Y.C. No. 2,804,232. Aug. 27, 1957.

Bottle Carrier of One-Piece Molded Plastic Having Consecutively Joined Panels Permitting Bottle Necks to Extend Through Top-Member. E. J. Lachance, Leominster, Mass. No. 2,804,232. Aug. 27, 1957.

PUMP

LIQUIDS GASES SLURRIES

WITHOUT CONTAMINATION OR CORROSION

Wavelike Motion of Steel Fingers Forces Material Through Tubing

Write for Descriptive Literature

Cap. 0.2 cc. per min. to 4.5 G.P.M.

Prices **$60.00** to **$550.00** depending on size and accessories

SIGMAMOTOR, INC.
22 North Main St. • Middleport, N.Y.

WHERE TO

- **STORE** Frozen Foods
- **BUY** Ingredients, Equipment, Parts, Services

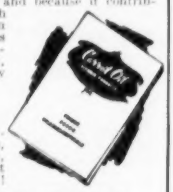
CARROT OIL

makes food

golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A activity.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A activity of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.



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New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals, important reading for most food processors. Write today!

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205 Broad St., South Whitney, Ind.

QUAKER CITY COLD STORAGE CO., INC.

PHILADELPHIA, PA.

3 WAREHOUSE LOCATIONS

Proper Temperature for Frozen Foods

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(My Commission expires March 30, 1959)

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Positions Vacant	Civil Service Opportunities	Employment Services
Positions Wanted	Selling Opportunities Wanted	Employment Agencies
Part Time Work	Selling Opportunities Offered	Labor Bureaus

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Send NEW ADS to FOOD ENGINEERING, Class Adv. Box 12, N. Y. 36, N. Y. for December issue closing November 27th

WE NEED
FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—junior to top-level

Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
220 S. State St., Chicago 4, Ill.
HArrison 7-8600

FOOD TECHNOLOGIST

Well established, rapidly expanding, Mid-Western firm packing salad dressings needs a Food Technologist. Opportunity for young man with or without experience to work in Quality Control and Product Development. Submit resume of education and experience, if any.

P-5993, Food Engineering,
520 N. Michigan Ave., Chicago 11, Ill.

Your Inquiries to Advertisers Will Have Special Value . . .

— for you — the advertiser — and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publisher to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

RESEARCH AND PRODUCT DEVELOPMENT

New and expanding research organization is looking for research scientists at the Ph.D. or Master's level to do independent research in the dairy foods field. Education major in dairy technology preferred. Relocation at Company expense to Omaha, Nebraska.

If interested, send a complete resume of your education, experience and area of interest to:

Frank X. Walsh, Personnel Supervisor, **Fairmont Foods Company, Omaha, Nebraska.**

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
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Flavor technologist to assist in flavor laboratory operations including flavor compounding, spray dyeing applications and finished product evaluations. Location metropolitan N. J. P-6363, Food Engineering.

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Salaried Personnel. $5,000-$30,000. This confidential service established 1927 is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F., P. O. Box 674, Manchester, Vermont.

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Food Technologist desires position in sales and technical service to baking, confectionery, ice cream, etc. industries in New England area. Reply PW-5726, Food Engineering.

Food technologist: excellent background in bakers supplies, canned and frozen products, food analysis, product development, formulation costs, equipment and plant layout. Experienced in labor relations and supervision. PW-6396, Food Engineering.

Dairy Technologists: College plus five years experience in control lab. Looking for lab or supervisory position in dairy field. PW-6411, Food Engineering.

German baker's yeast technologist, also making alcohol. Good exp. making yeast in U.S.A. wants good position. PW-6351, Food Engineering.

Sales Executive—20 years solid Essential Oil and related industries background, all phases direct sales and sales management, outstanding record, widely traveled, graduate chemist. Wants position of responsibility or solid business proposal with vigorous, growth company. Will relocate. Available January 1st. PW-6542, Food Engineering.

Food Technologist—Has improved quality, yield, equipment, labor output for frozen potato products. Seeks further opportunity to apply technological experience and training to Supervision of Production and Quality Control of food products. PW-6540, Food Engineering.

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FOR SALE

Peanut Butter Plant capacity 27,000#/day

2—Sharples #16V Super Centrifuge, St. St. separator bowl.
3—Bird T316 St. St. Continuous Centrifugals 32" x 50", 40" x 60".
2—Pneu. Scale 6 head capper, 53 mm.
3—Fitzpatrick Comminutors, St. St. models, D. F.
2—Filler Machine Co., 4 cyl. St. St. piston fillers.
5—Sparkler #33-S-28 Filters. Steel Body, St. St. plates.
1—Niagara type 316 S. S. Pressure Filter, model 510-28, 500 sq. ft.
5—Dewatering Presses — Davenport 1A, 2A; Louisville 8-Roll 36".
2—Double Drum Dryers: 42" x 100', 42" x 120", Buflovac 5' x 12' Single Drum Vacuum-Dryer. Unused. 36" x 84" (Vacuum)
3—St. St. Vac. Shelf Dryers, 100 sq. ft.
1—St. St. Spray Dryers: 19' Dia. x 20 H.
3—Rotary Steam Tube Dryers, 4' x 30'; 6' x 30'; 6' x 45'.
2—Nickel Evaporators 200 & 450 sq. ft.
1—Buflovak #6.5 St. St. Double Effect Evaporator, 588 sq. ft.
1—Stokes Type 316 St. St. Double Effect Evaporator, 250 GPH.
2—Flakers, Buffalo 32" x 90".
8—1800 gal. Steel Kettles, jacketed & agitated.
4—Mixers St. St. Double Arm, 5, 50, 75 gal., Sigma Blade; Jacketed.
3—2950 gal. Heil Stainless steel single axle Truck Tanks.
30—Stainless Steel Tanks—30 gal. to 10,000 gal. sizes. NEW & USED.
75—Welded Steel Tanks—Brewery lining; 4000 gal. to 10,000 gal.

BOTTLING CANNING PROCESSING — MACHINERY PERRY SUPPLIES

PERRY EQUIPMENT CORP.

1411 N. 6th St., Phila. 22, Pa. Phone: POplar 3-3505

FOOD TECHNOLOGIST FOR TECHNICAL SERVICE

Position open for Food Technologist with experience in baking, particularly wholesale bread. Responsibility will include laboratory and customer contract. Location Clinton, Iowa.

Submit resume to:

Director
Technical Sales Service Department
CLINTON CORN PROCESSING COMPANY
Clinton, Iowa

FOR SALE!

Standard-Knapp Model 151 packer for 6 & 12-oz. cans with compression unit, cap. up to 400 cpm, price ⅓ of new;
6 one-piece stainless steel clad tanks, approx. 400 gal. each, 8' OD x 25'4", never used.

CHARLES S. JACOBOWITZ CORP.
3083 Main, Buffalo 14, N. Y.

FOR SALE

2 Water Tanks, 2,500 gallon

5' diameter x 18' long, 125 lb. working pressure, 7/16 shell thickness, new in 1950. Excellent shape.

FS-6561, Food Engineering
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

FOR SALE

3—S. S. 20 gal. Jacketed Kettles.
1—Aluminum 100 gal. Jacketed Kettle.
1—350 gal. Copper Kettle with Agitator.
1—Vac. Shelf Dryer 20 shelves.
1—Vac. Shelf Dryer 6 shelves.
1—1200 gal. S. S. Tank.
3—750 gal. S. S. Tanks

Complete listings—Bulletin A-39
Write for Copy

The Machinery & Equipment Corp.
293 Frelinghuysen Ave., Newark 12, N. J.
TAlbot 4-2050

BOILERS

HI-PRESSURE
Complete stock from 10-2,000 h.p.
Nation's largest inventory, New & Used

WABASH POWER EQUIPMENT
9750 Skokie Blvd., Chicago (Stokie), Ill., OR 3-8118

FROZEN FOOD SLICER FOR SALE

Gemco Model Number 2-16 powered by a 220 volts, 60 cycle, 3 phase motor.

Booth Fisheries Corporation
1220 N. Main St., St. Louis 6, Mo.

FOR SALE

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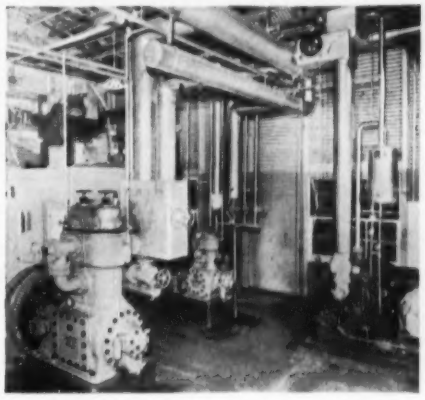

View of the Tracy engine room showing three of the four Vilter compressors. Vilter vertical shell and tube condensers and an evaporative condenser are also installed.

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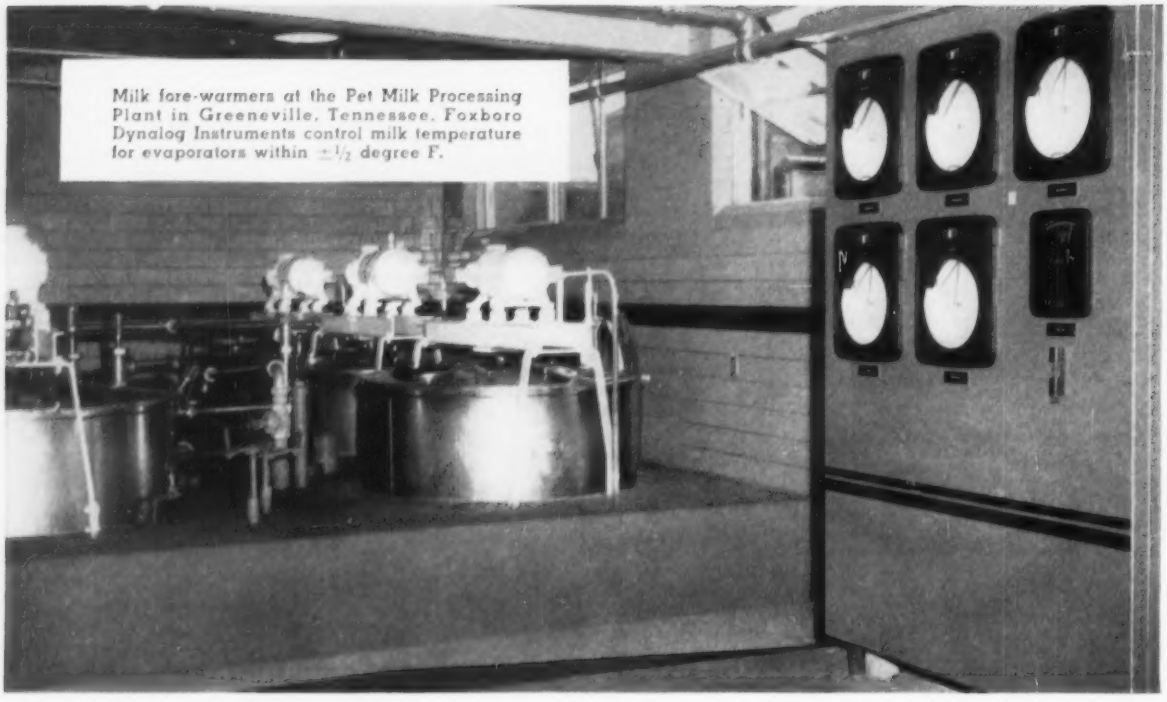

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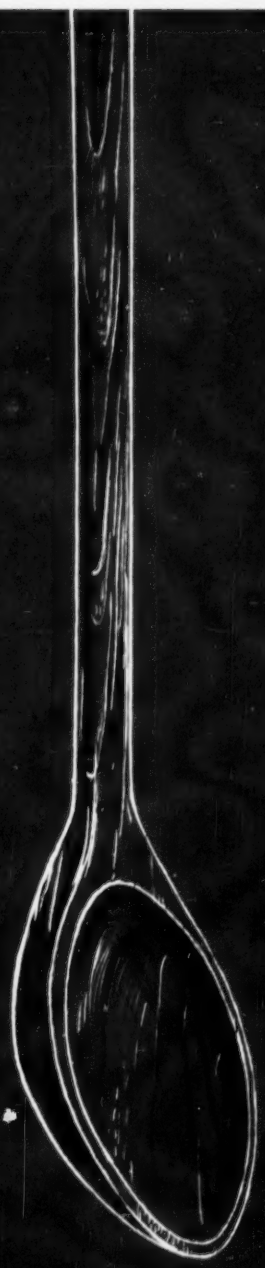

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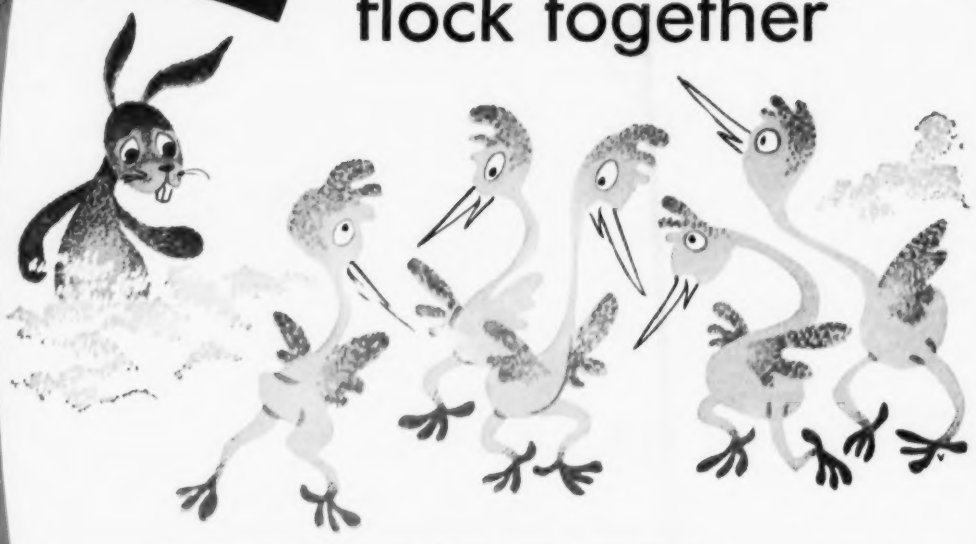

The source of this goes back to the "Book of Wisdom" by Ben Sira written about 190 B.C. Numerous variations appear in "Promos and Cassandra" in 1578, in Shakespeare's "Henry VI" and others, including one elaborated comment in Secker's "Nonsuch Prof" of 1660: "We say that birds of a feather will flock together. To be too intimate with sinners is to intimate that we are sinners too."

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